INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

WORLD METEOROLOGICAL ORGANIZATION

ARGOS JOINT TARIFF AGREEMENT

TWENTY-SIXTH MEETING

La Jolla, USA, 23-25 October 2006

FINAL REPORT

N O T E

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C O N T E N T S

GENERAL SUMMARY OF THE WORK OF THE SESSION

1. ORGANIZATION OF THE MEETING

1.1. OPENING OF THE MEETING

1.1.1 The twenty-sixth meeting on the Argos Joint Tariff Agreement was opened at 0900 on Monday, 23 October 2006, in the conference room of the Sea Lodge Hotel in La Jolla, USA, by its Chair, Mr Yves Tréglos. Mr Tréglos welcomed the participants to the meeting, and expressed his thanks to NOAA for providing thoughtful preparations and for agreeable surroundings.

1.1.2 The list of participants in the meeting is given in *Annex I*.

1.2. ADOPTION OF THE AGENDA

1.2.1 The Meeting adopted its agenda, which is given in *Annex II*.

1.3. WORKING ARRANGEMENTS

1.3.1 The Meeting agreed on its working hours and other arrangements for the conduct of the session. The documentation was introduced by the Joint Secretariat.

2. REPORT OF THE CHAIR OF THE JTA

2.1 The chairman presented a report on his activities in support of the participants in the JTA since the previous meeting (JTA-XXV, Buenos-Aires, 24-26 October 23005). As foreseen at JTA-XXV, a first task falling on the chairman was to: (i) establish a small working group to review the past of the JTA and derive lessons; and (ii) prepare a first draft of JTA history. This topic is dealt with in full details under agenda item 8.

2.2 The chairman attended the 40th Argos Operations Committee meeting in Virginia Beach, from 21 -23 June 2006. The following topics were discussed *inter alia* during the meeting:

- a degradation of the Argos performance had been observed above Europe (mainly above Mediterranean area and Central Europe), especially for the beacons with an output transmitted power of 125 or 250 mW (as currently used for animal tracking applications). In this part of Europe, a correct reception of beacons was possible only if their transmitted power was > 1 W, which was the nominal value required for the Argos beacons. This phenomenon was likely to be due to interferences with transmitters that did not comply with ITU rules and that were unlikely to be switched off by their operators;

- with regard the next generation of Argos instrument, a review of users' requirements had been conducted by CLS through a survey undertaken during the last 2-3 years. Those requirements were therefore well known, except those concerning the downlink, which was obviously an unknown world. It should be noted that all user requirements should be specified during 2007, which was the deadline for such specification according to the instrument schedule;

- the problem of the "blind orbit" seemed to be solved, or close to (see agenda item 5);

- the chairman reported on the outcome of JTA-XXV and Mr Eric Locklear, newly appointed representative of the US ROC, on the US participation in the JTA;

- Mr. Christophe Vassal reported on CLS methodology to derive the Argos basic costs to be attributed to the JTA (see agenda item 6).

2.3 The chairman visited CLS in Toulouse on 11 September 2006, to assess (i) how JTA-XXV decisions had been implemented and (ii) the state of preparation of JTA-XXVI from CLS standpoint. Discussions mainly dealt with the report by CLS on the new tariff and the associated "general philosophy" of the tariff. Details on this topic will be reported under agenda item 6. The chairman recalled and highlighted that CLS had "*to provide [the participants] with the report on costs to be attributed to the JTA, with an analysis on previous year and a projection to the current year, by the end August each year*", and CLS promised to issue the report as soon as possible.

2.4 The Meeting expressed its appreciation to Mr. Tréglos for his dedicated work during the intersessional period.

3. REPORT ON THE 2006 GLOBAL AGREEMENT

3.1 The Meeting recalled the decision and agreement made at its 25th meeting (Buenos Aires), that all JTA members joined in the new tariff scheme which was agreed at the 24th Meeting from 2006 onward, on the understanding that the various figures presented would be tested, in particular regarding the B coefficients, and might be adjusted as necessary.

3.2 Mr Philippe Gros, CLS, reported that a final total of 2723.5 PTT-years had actually been consumed in 2006, made up as follows:

Countries	PTT-year	Countries	PTT-year
AUSTRALIA	58.7	KOREA, REPUBLIC OF	4.2
AUSTRIA	0.4	THE NETHERLANDS	10.1
BRAZIL	10.0	NEW ZEALAND	6.5
CANADA	142.8	NORWAY	15.0
CHILE	0.0	SOUTH AFRICA	17.1
CHINA	4.2	SPAIN	4.0
DENMARK	17.6	SWEDEN	2.1
FINLAND	2.3	UNITED ARAB EMIRATES	11.5
FRANCE	94.5	UNITED KINGDOM	65.0
GERMANY	45.9	UNITED STATES	2191.3
INDIA	7.7	OTHERS	0.1
ITALY	12.5		
TOTAL			**2723.5**

3.3 Mr Gros noted that consumption, both in term of active PTTs or PTT-years had been increasing all over the year 2006, with almost even numbers for “Animals” and “Buoys and others”; and smaller but increasing numbers for the float family. The actual consumption showed huge differences between categories, that “Drifters & Others” - also referred to as the “Full time” category in the previous meeting report - consumed about four times more than the “Animals”, the second “top” category.

3.4 The Meeting recalled that transmissions from inactive platforms were no longer charged since 2004. It was noted that the number of IDs in Inactive status was around 120 and the PTT-year consumption around 70. The Meeting considered that new transmitters with solar panels might increase this trend in the future, therefore again encouraged users and manufacturers to take this into account by programming their PTTs for the expected duration of their experiments.

3.5 The Meeting noted that E-SURFMAR should appear separately in the CLS report, instead of being merged within one particular country. CLS agreed therefore to introduce a new “country”, named “EUROPE”, in the reports to the next meetings.

3.6 Detailed information on the 2006 Global Agreement is given in *Annex III*.

4. REPORT ON THE DEVELOPMENT OF CLS

4.1 The reports on 2005-2006 operations and on system improvements and development projects had already been presented to the preceding DBCP session, which most of the meeting attendees were attending. The full reports are attached as *Annexes IV and V*, respectively.

5. REVIEW OF USER'S REQUIREMENTS

5.1 The Meeting noted a report from the Chair of the DBCP on the main results of the twenty-second session of the Panel, which had taken place in La Jolla from 16 to 20 October 2006. These included in particular the following specific recommendations to the JTA:

(i) Efforts should continue to identify and minimise delays affecting the timely distribution of data inserted by CLS onto the GTS;

(ii) In support of the above, additional LUT sites should be identified and brought on line to improve data flow from poorly served areas such as the South Atlantic and South Pacific;

(iii) Pressure should be maintained on NOAA/NESDIS to bring the Svalbard ground station on line as soon as possible in order to address the blind orbit problem that had been identified in 2002 and still remained unresolved;

(iv) CLS should, if possible, continue to support the work of the JTA chair, with the assistance of the DBCP as required. The estimated cost for the JTA would be USD 15,000.

5.2 With regard to the specific user requirements raised at JTA-XXV, the Meeting noted the following actions or considerations:

(i) Data streams from LUTs:

Within the current table of LUTs, CLS proposed to add a column "Operation %" that would give the percentage of time in a given period (typically one year) during which the LUT was fully operational.

	Antenna	Code	Country	Operator	Possible satellites	0per.%
1	Buenos Aires	BA	Argentina	INTA	**N12, N14, N15, N16, N17,**	
2	Cape Ferguson	CP	Australia	NOAA/ NESDIS	**, , , N16, N17, N18**	
3	Casey	CA	Australia (Antarctica)	BOM	**N12, , N15, N16, N17,**	
4	Cayenne	CY	France (Guyana)	IRD	**N12, , N15, N16, N17,**	
5	Darwin	DA	Australia	BOM	**N12, , N15, N16, N17,**	
6	Gilmore	GC	USA	NOAA/ NESDIS	**N12, N14, N15, N16, N17, N18**	
7	Halifax	HF	Canada	Can. Coast Guard	**N12, N14, N15, N16, ,**	
8	Hatoyama	HA	Japan	NASDA/ EOC	**N12, N14, , , N17,**	
9	Hawaï	HW	USA	NOAA/NWS	**N12, , N15, N16, N17,**	
10	Hyderabad	HY	India	ISRO	**N12, N14, N15, N16, N17,**	
11	La Réunion	RN	France (Reunion Island)	Météo France	**, , , , N17, N18**	
12	La Réunion	RE	France (Reunion Island)	IRD	**, , N15, , N17, N18**	
13	Lannion	WE	France	Météo France	**, , , N16, N17,**	

[etc.]

(ii) Investigation of the Indian Ocean coverage by LUTs:

There were two LUTs in La Réunion Island; the LUT operated by IRD received the satellites NOAA-15, -17 and -18; the LUT operated by Météo France received the satellites NOAA-17 and -18. The satellites NOAA-12, -14 and -16 were not received by these two LUTs.

During the period 2005-2006, some real-time data flows were not properly received because the link between CLS and the LUTs was not functioning nominally. CLS, IRD and Météo-France have worked jointly to make the operation situation nominal. Further action was being undertaken to try and receive NOAA-12 and -14 through the Météo-France LUT. A positive result was expected.

Despite of many CLS enquiries, the Hyderabad LUT still did not provide data flows to CLS.

(iii) *Automatic Distribution System (ADS) strategy:* relevant actions were being taken, as noted under item 6.5 (v).

Blind Orbit Support

5.3 The Meeting recalled the presentation at DBCP-XXII by the NOAA Environmental Satellite and Information Service (NESDIS) representative, Mr. Chris O'Connors, on NOAA efforts to collect blind orbits and improve stored data collection latency. NOAA had successfully tested the collection of blind orbits through the Svalbard NPOESS antenna. In order to move the Argos data to NOAA's Environmental Satellite Processing Centre (ESPC) it would be necessary to use

the MetOp IT infrastructure in Suitland Md. This equipment would not be available for this activity till after the MetOp satellite was declared operational. The successful launch of the MetOp A satellite in October should make it possible to begin the scheduling of non IJPS satellites (NOAA 12, 14, 15, 16, and 17) in the spring of 2007. A separate antenna located at Svalbard would collect blind orbits from the IJPS satellites (NOAA 18, N', and the MetOp satellites).

Ground station action

5.4 Mr. O'Connors was going to contact NOAA member ground stations providing real time Argos data collection to determine their capability to collect additional real time data sets. Not all stations had the resources or technical capability to receive the data. The Meeting expressed its appreciation to Mr. O'Connors for volunteering to report back to it on this topic in 2007.

5.5 The Meeting noted with appreciation that significant progress had been made during the past with regard to the Users' Requirements, and decided that the list of JTA's achievements be included in the final report of the next meeting (see also paragraph 8.3).

6. REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS

6.1 In line with its longstanding request, the Meeting was presented by Mr C. Vassal with details of the finalized Argos operating costs for 2005 as well as of the amortization and promotion and marketing items for the same year. These are given in *Annex VI*.

6.2 The Meeting acknowledged the information given, and noted the final 2005 figures of 6,015 K€ for personnel-related expenses, 5,115 K€ for other expenses, and 634 K€ for amortization, for a total of 11,763 K€. It further noted with appreciation the detailed breakdown of such costs for 2005, as well as the evolution of these figures over previous years, presented for comparison. Mr Vassal noted that, for year 2005, the costs to be attributed to the JTA, computed according to the methodology developed by CLS since 3 years now, was 6,130 K€.

6.3 The Meeting recalled the 5 year plan presented at the 25th meeting, which contained an expected revenue shortage in 2005 due to "soft landings" for certain programmes which would have been heavily impacted by the new tariff scheme. After review of the updated 5 year plan by Mr Vassal, the **Meeting agreed to continue to provide the same "soft landings" through 2007, on an exceptional basis, with the clear understanding that all programmes would move towards the agreed tariff structure over the course of the following years [Agreement].** It was indeed recognized that there was great difference between those who were benefiting from the soft landing and others.

6.4 With regard to the specific action items identified by previous meetings, the Meeting noted:

(i) *Unused ID Numbers and 28 bit IDs* (see summary report of JTA-XVIII, paragraph 6.2): The Meeting noted that 18,961 ID numbers out of 27,472 IDs (about 69%) were 28 bit, therefore that the situation had improved from last year (about 62%). In line with its previous year's decision, the Meeting considered that those unused IDs charges should be maintained.

(ii) *Incentive for frequency spreading*: CLS reported that it had been promoting activities to educate users and ask manufacturers to utilize voluntarily all the available bandwidth. Such promotional activities were proposed to continue. In this context, CLS reported that its new ArgosWeb site had been implemented in September 2006. Web pages dedicated to manufacturers were under design. All along the year, CLS sad been undertaking, upon user or manufacturer requests, dedicated studies and provided advice on best frequencies (and transmit power) to be used.

(iii) *ArgosDirect (ADS) appropriate strategy for users in Polar regions*: Three actions were taken, as following:

- A discount up to 50% had been applied on data volume to all ArgosDirect disseminations.
- A dedicated rebate was granted to the affected programs (IABP)
- In addition, ArgosDirect strategy for this program had been optimized. CLS had developed a dedicated processing and format to disseminate IABP Ice Mass Buoys (IMB) onto the GTS, so the real time ArgosDirect was no longer needed and related costs were cut down. In addition, the users were happy to have their inserted onto GTS without additional work on their side.

(iv) *Downlink tariff and high data rate channel policy*: Noting that METOP 1 would carry an Argos-3 instrument equipped with the downlink capability and the 4.8 kbits high data rate channel, it was suggested to continue with the proposed Downlink Tariff Policy mentioned at JTA XXII, that is a fixed monthly fee of possibly 20 € per active PTT. As per the high-data rate channel, it was proposed to add a category “high data rate” with a specific day unit rate, for example 1/3 more than the “Large Volume – Float” category, i.e. 12 €. In line with discussions at JTA XXII meeting, to foster testing and using these new capabilities, CLS proposed to grant free access to these new services for a one year period.

(v) *Processing Iridium data*: CLS America was currently processing for GTS dissemination the Iridium data from ARGO floats deployed by the University of Washington. In parallel, CLS was studying the feasibility of integrating Iridium data set directly in the Argos data base. This would enable users to benefit from all the Argos service capability such as platform calibrations curves, online data dissemination and data sharing, databank, GTS processing etc.

CLS PROPOSAL FOR FUTURE AGREEMENT

6.5 Mr Christian Ortega, from CLS, presented the CLS proposal for adapting the present tariff structure to some difficulties encountered by a few users. Basically, the proposal was, provided that the expected agreement for large programmes (i.e. OCO) was settled (see paragraph 6.18), to:

- Apply the time slot accounting to all categories with no increase of “B” coefficient;
- Reduce the “B” coefficient for marine animals from 9 euros to 6 euros over a three year period, 2007-2009;

- Suppress progressively the “soft landing” accommodations over the same period.

The full presentation by Mr Ortega is reproduced in *Annex VII*.

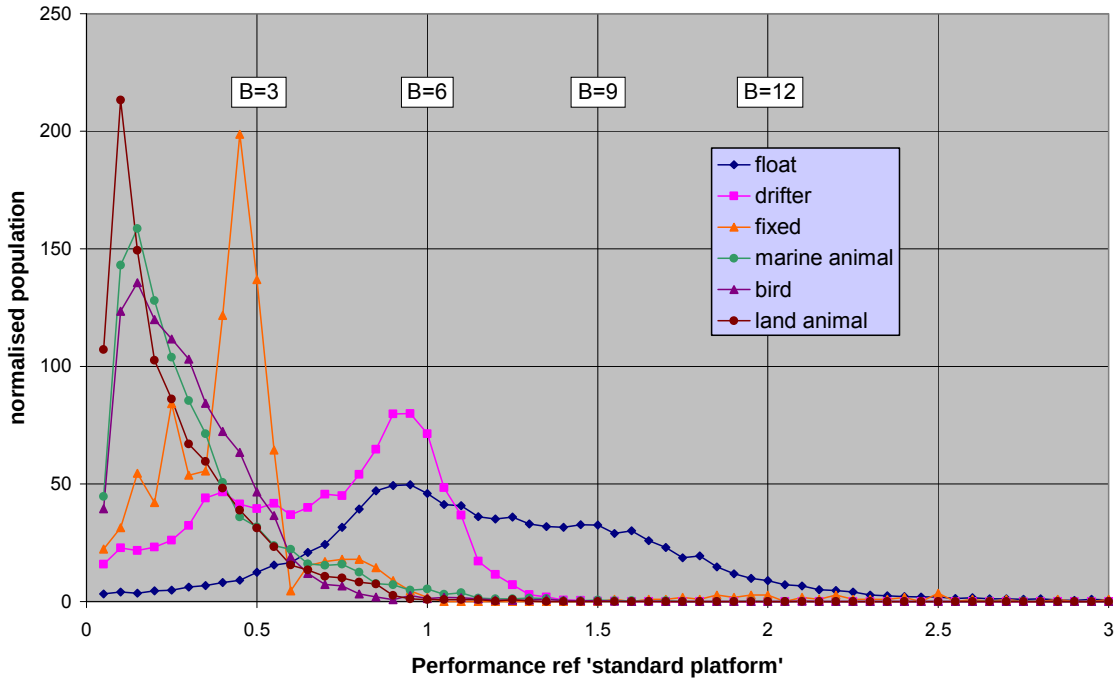
EVALUATION OF OTHER CHARGING ARGORITHMS

6.6 The Meeting recalled the decision by its 25th meeting in 2005 (Buenos Aires), that CLS ‘should evaluate other charging algorithms that might offer a better long-term solution for the apportioning of costs according to system use, and report back to the next session’ (Final report, JTA XXV, para 6.14).

6.7 In this context, Mr David Meldrum, UK ROC, was invited to Toulouse in July 2006 to work with CLS in evaluating other possible charging algorithms, including the one he proposed at JTA-XXV which would set the B coefficient according to system occupancy. A prime goal of the work was to investigate to what extent the existing tariff structure could be tuned to accommodate all classes of platform on an equitable basis. To this end, CLS created for Mr Meldrum a detailed set of usage statistics for the entire population of JTA platforms for January – June 2006. These were analysed in terms of the number of messages received from each platform compared to the number theoretically possible from a perfect ‘standard’ platform at the same location at the same time. A ‘standard’ platform was defined as transmitting every 90 seconds throughout the day.

6.8 The computed performance was effectively a measure of the extent that a given platform made use of the system resources available to it during every timeslot for which it was charged. The resulting performance statistics are shown below, with the population in each category of platform normalized to 1000. As expected, drifters were distributed between 0 and 1 with a noticeable peak close to 1, i.e. their performance was close to that of the standard platform. Similarly, fixed platforms peaked at 0.5 as expected, reflecting their lower repetition rate. Floats exhibited a wide range of performance values, possibly in line with the rather wide variation in repetition rates declared for these platforms, and had a mean performance rather higher than drifters, close to 1.5. For these three classes of platform, the existing tariff B rates (6, 3 and 9 euro respectively) were in fact a good reflection of the actual average usage.

6.9 The graph also showed that all classes of animal platform, not just marine mammals, performed very poorly compared to the standard platform. Indeed their average performance was less than 0.15. By any standard, the B-rate paid by these platforms (9 euro, the same as floats with a mean performance close to 1.5) was grossly disproportionate to the level of system use that they enjoyed. This disparity had been recognised by CLS, and they had worked with the most severely affected programmes to offer ‘soft landings’



6.10 Nonetheless, it was recognised that soft landings were not an equitable basis for developing a long-term, robust tariff structure that fairly apportioned costs according to system use. Accordingly it was seen as vital, within the context of the JTA principles of fairness, openness and the promotion of science, that the tariff be reviewed for animal tracking platforms. CLS had already come to the meeting with a proposal that would converge the B-rate, for marine mammal programmes only, to a new lower rate of 6 euro. This would allow existing programmes to start reducing their B-rate from 9 euro, while at the same time soft landing programmes paying less than 6 euro would gradually increase their contributions.

6.11 A number of options for progress were identified, that would retain the essence of the CLS convergence proposals, but that would retain sufficient flexibility to allow a more optimal solution to be achieved for all classes of user. Mr Meldrum made a number of suggestions, as follows:

- The CLS proposal on rate convergence was constructive and was a good basis for negotiation;
- The time scale and step-size for convergence should be reviewed;
- The B-rate to which programmes should converge needed to be reviewed;
- All animal tracking programmes should be included;
- Convergence should commence in 2007, but a working group should make a study to arrive at an optimal B-rate in intersessional period.

6.12 The full report by Mr Meldurm is reproduced in *Annex VIII* to this report

TARIFF ISSUES CONCERNING MARINE ANIMAL TRACKING

6.13 The Meeting recalled that, at its 25th meeting, it was decided to invite representatives from the animal tracking community, and work with them to ensure that their current and planned science was not adversely impacted by the current tariff. Four scientists from these communities attended the meeting and reported on the consequences of the new tariff scheme agreed at its 24th

meeting (2004, Chennai). Prof Mike Fedak (UK) noted that, as compared to the old Limited Use Service (LUS) tariff, the new tariff structure of 6-hourly time slots has resulted in a substantial increase in the cost incurred, therefore impacting severely relevant scientific research programmes.

6.14 In this context, the participants from animal tracking communities proposed that a form of LUS be reinstated across all animal tracking programs, with appropriate modification, to resolve animal tracking tariff issues. They requested CLS to conduct an empirical analysis of past animal tracking data (i.e., 2005 + 2006) to evaluate the viability of an LUS solution, given the relatively low bandwidth used by their PTTs. The proposal made by the participants from animal tracking communities is reproduced in *Annex IX*.

6.15 The Meeting considered that the new tariff structure globally applied from 2006 was convenient for the majority of Argos users, yet there was a need to adjust some details for a few users. In this context, the Meeting felt that relevant study and simulations should be conducted as soon as possible so that such an adjustment could be applied in future to the global agreement.

6.16 The Meeting therefore requested CLS and participants from animal tracking communities to conduct a study and simulations on possible tariff adjustment based on the proposal detailed in *Annex IX*, to be completed by early 2007. Should the outcome of the study and simulations be not acceptable to the JTA, then CLS would remake the proposal detailed in *Annex VII*. In any case, a final and definite decision should be taken at the 2007 JTA Meeting.

REVIEW OF THE ARRANGEMENTS FOR LARGE PROGRAMMES

6.17 The Meeting then reviewed the arrangements that had been agreed when in Chennai (JTA-XXIV) with regard to a reduced B coefficient for large programmes. These included a B coefficient of 3 euro for programmes using more than 900 platform-years per year, a rate that had been introduced specifically to cater for the needs of the NOAA/OCO deployments. Nonetheless, OCO had negotiated a two-year fixed price contract with (then) Service Argos Inc, at 1.35 million euro per year, which did not adhere to this provision. Over the two years, OCO usage had exceeded the figure envisaged, and would have generated an extra 1.01 million euro for the JTA had the 3 euro rate been applied.

6.18 Accordingly, the Meeting reviewed a proposal to introduce a new B coefficient of 2 euro for programmes that used more than 1200 platform-years per year, specifically to address the OCO issue, their foreseen usage and funding limitations. **The meeting agreed on this new proposal, considering that this provision fully complied with the rules of the new tariff, and specifically taking into account the agreement by the US ROC that NOAA/OCO would pay along the agreed upon rules. [Agreement].**

TIME SLOT APPLICATION

6.19 The Meeting recalled its discussion at its 25th meeting (Buenos Aires) on the application of the time slot, that *"The Meeting reaffirmed that the agreement by the Meeting at JTA-XXIV regarding the implementation of the time-slot approach in the new tariff scheme was, in principle, relevant to all categories…"*, and *"At the same time, the Meeting noted the potential financial implications of applying the time-slots to drifters and hence bringing an additional risk to*

what was an already potentially strong decrease in revenue. Therefore it agreed that the universal application of time-slots should be not applied before 1 January 2007, so that 2006 results can be used to assess whether an adjustment in the B coefficient would be necessary to insure the JTA revenue."

6.20 As a consequence of the above discussion, **the Meeting noted that all categories of platforms would henceforward benefit from the time slot computation as of 1 January 2007 [Agreement]**.

PERIODIC REPORTING BY CLS

6.21 The Meeting recognized that there was a need for participants to get the information on the financial status well in advance of the annual meeting. It therefore requested CLS to provide the report on costs to be attributed to the JTA, with an analysis on previous year and a projection to the current year, by 15 September each year. Such information should be available on the JCOMMOPS website together with other meeting documents.

6.22 The Meeting thanked CLS for making available some details of the JTA and non-JTA activities in terms of active IDs and revenue, as provided previously in meeting documents, and requested that this information be regularly made available in its reports to each JTA meeting.

7. TERMS AND CONDITIONS OF THE 2007 GLOBAL AGREEMENT

7.1 The principles agreed upon at JTA-XXIV, as well as those established under agenda items 5 and 6 above, were used to draft the Terms and Conditions for the 2007 Agreement for all participants. Eventually, and also taking into account a few editorial amendments, the Meeting agreed on the Terms and Conditions for the Agreement for 2007 ("status quo" from 2006 global agreement, in principle).

7.2 The following modifications were introduced into the 2007 Terms and Conditions, as compared to those for 2006, apart from some editorial amendments:

(i) 2006 is replaced by 2007;

(ii) Under "**USER BASIC SERVICE CHARGES**", it is noted that "From 2007 the time slots will be applied to all categories";

(iii) Under "**USER BASIC SERVICE CHARGES**", PTT day unit for a large programme is introduced; 2 euros for over 1200 PTT-years.

The Terms and Conditions for the Agreement for 2007 are given in *Annex X.*

8. THE FUTURE OF THE JOINT TARIFF AGREEMENT

8.1 The chairman introduced this agenda item in thanking the members of the intersessional review group on the future of the JTA. He explained the group had considered it had mainly to review the history of the JTA and highlight in that history the elements that could be relevant to a reflection on the future of the JTA.

8.2 The report of the review group was made up of 4 "sheets":

- **JTA history - Sheet 1** described the birth of the JTA. Extensive use had been made of documents prepared in the past by individuals highly knowledgeable of the JTA.

- **JTA history - Sheet 2** listed the JTA meetings since the inception.

- **JTA history - Sheet 3** detailed, in a tabular form, what, in the group's view, should be highlighted in each JTA meetings.

- **JTA history - Sheet 4** picked here and there elements and thoughts that the group considered useful for the consideration of the future of the JTA. It represented a first attempt to illustrate how the past could more or less enlighten the future.

8.3 The chairman made a brief presentation of the report of the review group (see *Annex XI*) and concluded his presentation by requesting comments from the meeting. The participants expressed satisfaction to the review group for the amount of work accomplished. They further requested that the documents be completed by a review of the relationships between OPSCOM and the JTA, and be maintained as a dynamic document.

8.4 In addition, the chairman proposed the establishment of what he called "a permanent JTA review mechanism (Jrev)", for which he suggested terms-of-reference, a membership and a modus operandi. The meeting eventually decided to establish such a mechanism, with the terms-of-reference, membership and modus operandi as detailed in *Annex XII*.

9. FUTURE PLANS AND PROGRAMMES

9.1 Written reports on future plans and programmes for the use of the Argos System in 2006 were submitted to the meeting. Following normal practice, these reports are given in *Annex XIII*.

10. ELECTION OF THE CHAIR

10.1 Under this item, the Meeting firstly agreed that its practice for a number of years of electing an “independent” Chair, and of funding his/her work on behalf of JTA participants through the JTA, had proven very successful, and should therefore be continued for the coming year (see paragraph 5.1 (iv) and 5.2 (iv).)

10.2 The Meeting re-elected Mr Yves Tréglos as its Chair, to hold office until the end of JTA-XXVII.

10.3 The Meeting also agreed to establish the position of an unpaid Vice-Chair, as of its 27th meeting in 2007.

11. DATE AND PLACE OF THE NEXT MEETING

11.1 In line with the agreement of the preceding nineteenth session of the Data Buoy Co-operation Panel, the Meeting accepted the kind offer of the Intergovernmental Oceanographic Commission (IOC) that the twenty-seventh meeting on the Argos Joint Tariff Agreement would take place in Paris, France. Tentative dates for the session were agreed as 22 ~ 24 October 2007,

following immediately after the twenty-third session of the DBCP.

12. CLOSURE OF THE MEETING

12.1 In closing the meeting, the Chair expressed his considerable gratitude to the staff members of NOAA, particularly to Dr Bill Burnett for their thoughtful organization and comprehensive support, and to the Joint Secretariat for their dedicated assistance, as well as to all participants for the good spirit of mutual understanding in which the sometimes difficult discussions had taken place.

12.2 The twenty-sixth meeting on the Argos Joint Tariff Agreement closed at 1130 hours on Wednesday, 25 October 2006.

ANNEX I

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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 CHAIRMAN OF THE JTA

3. REPORT ON THE 2006 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 2007 GLOBAL AGREEMENT

8. THE FUTURE OF THE JOINT TARIFF AGREEMENT

9. FUTURE PLANS AND PROGRAMMES

10. ELECTION OF THE CHAIRMAN

11. DATE AND PLACE OF THE NEXT MEETING

12. CLOSURE OF THE MEETING

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ANNEX III

REPORT ON THE 2006 AGREEMENT

1 RECALL OF 2005 PARTICIPATION

	Buoys & others		Floats	
Country	Average active PTTs/month	Total PTT.years	Average active PTTs/month	Total PTT.years
AUSTRALIA	38	20.3	71	2.4
AUSTRIA				
BRAZIL	8	5.4		
CANADA	45	16.9	76	6.4
CHILE			1	0.0
CHINA	4	2.5	18	1.7
DENMARK				
FINLAND	3	2.1		
FRANCE	141	57.6	200	15.0
GERMANY	50	26.9	137	12.0
INDIA	12	2.9	60	4.7
ITALY	7	2.6	16	1.3
KOREA, REPUBLIC OF	3	0.8	85	3.4
NETHERLANDS	4	1.8	4	0.2
NEW ZEALAND	9	5.4		
NORWAY	15	6.3	10	1.1
SOUTH AFRICA	22	16.2		
SPAIN	2	1.1	10	0.5
SWEDEN				
TAIWAN, REPUBLIC OF				
UNITED ARAB EMIRATES				
UNITED KINGDOM	61	31.7	94	9.3
UNITED STATES	2151	1659.8	1159	96.3
Total	**2573**	**1860**	**1942**	**154**

Table 1a: Average number of active PTTs per month and total PTT.years per country and per PTT category, in 2005 (First half table)

	Animals		Fixed stations	
Country	Average active PTTs/month	Total PTT.years	Average active PTTs/month	Total PTT.years
AUSTRALIA	116	17.9	25	18.0
AUSTRIA	6	0.4		
BRAZIL	16	2.4	2	2.1
CANADA	615	119.4	1	0.1
CHILE				
CHINA				
DENMARK	43	4.9	17	12.7
FINLAND	2	0.2		
FRANCE	31	6.6	29	15.5
GERMANY	59	7.0	0	
INDIA	2	0.0		
ITALY	9	2.5	10	6.1
KOREA, REPUBLIC OF	0	0.0		
NETHERLANDS	11	2.8	8	5.3
NEW ZEALAND	9	1.1		
NORWAY	24	4.3	5	3.3
SOUTH AFRICA	8	0.8	1	0.1
SPAIN	23	2.3		
SWEDEN	15	2.1		
TAIWAN, REPUBLIC OF	1	0.1		
UNITED ARAB EMIRATES	61	11.5		
UNITED KINGDOM	110	23.0	1	1.0
UNITED STATES	1885	367.1	75	68.1
Total	**3046**	**576**	**174**	**132**

Table 1b: Average number of active PTTs per month and total PTT.years per country and per PTT category, in 2005 (Second half table)

	Average active PTTs/month	Total PTT.years
All countries	**7735**	**2723.5**

Table 1c: Average number of active PTTs per month and total PTT.years all countries and all categories, in 2005

2 REPORT ON 2006

2.1 Average active PTTs per month per country

COUNTRY	2005 actual average active PTTs/month	2006 extrapolated average active PTTs/month
AUSTRALIA	250	307
AUSTRIA	6	4
BRAZIL	27	33
CANADA	738	883
CHILE	1	17
CHINA	22	17
DENMARK	60	61
FINLAND	5	7
FRANCE	401	494
GERMANY	246	198
INDIA	73	101
ITALY	42	30
KOREA, REPUBLIC OF	88	96
NETHERLANDS	27	29
NEW ZEALAND	18	29
NORWAY	53	75
SOUTH AFRICA	30	35
SPAIN	35	85
SWEDEN	15	10
TAIWAN, ROC	1	1
UNITED ARAB EMIRATES	61	69
UNITED KINGDOM	267	276
UNITED STATES	5270	5898
Total	**7735**	**8755**

Table 2: Average number of Active platforms per month and per country, actual in 2005 and extrapolated in 2006 from January-July 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.

2.2 2006 Consumption per country

COUNTRY	Actual 2005 PTT.years	Extrapolated 2006 PTT.years
AUSTRALIA	58.7	87.0
AUSTRIA	0.4	0.1
BRAZIL	10.0	9.2
CANADA	142.8	137.0
CHILE	0.0	1.7
CHINA	4.2	1.8
DENMARK	17.6	22.6
FINLAND	2.3	2.7
FRANCE	94.5	194.0
GERMANY	45.9	26.9
INDIA	7.7	19.8
ITALY	12.5	12.1
KOREA, REPUBLIC OF	4.2	5.8
NETHERLANDS	10.1	12.8
NEW ZEALAND	6.5	10.0
NORWAY	15.0	30.8
SOUTH AFRICA	17.1	23.9
SPAIN	4.0	13.8
SWEDEN	2.1	1.5
TAIWAN, ROC	0.1	0.1
UNITED ARAB EMIRATES	11.5	18.2
UNITED KINGDOM	65.0	69.9
UNITED STATES	2191.3	2488.8
Total	**2723.5**	**3190.4**

Table 3: Numbers of PTT.years. Actual consumption in 2005 and extrapolation for 2006 based on January-July actual consumption

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

2.3 Consumption evolution over year 2006

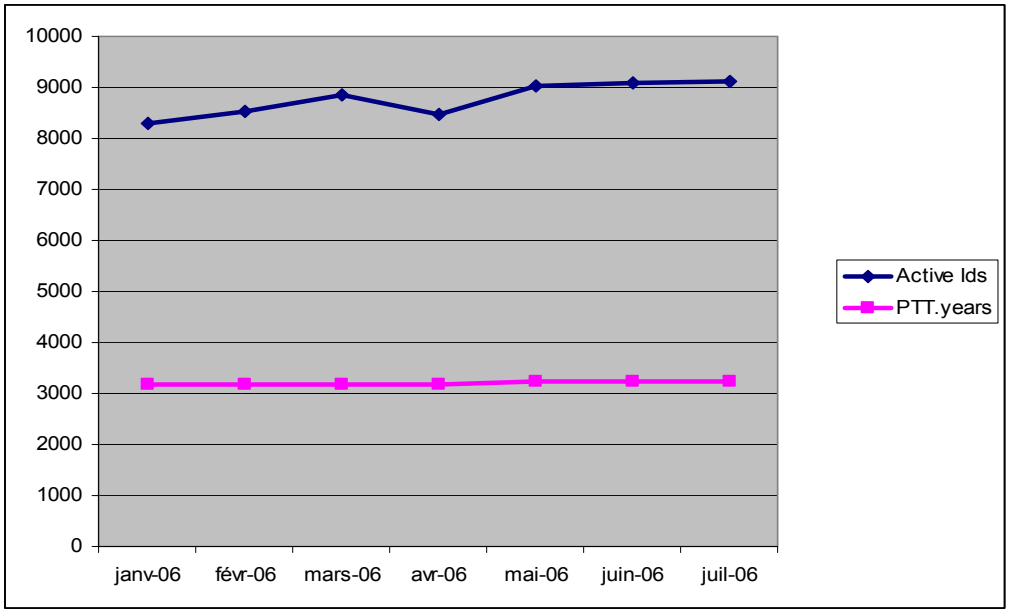


Figure 1: Consumption evolution over the year in Active PTTs and PTT.years

During the 7 first months of 2006, the number of active PTTs has an increasing trend; the number of PTT.years is rather stable.

2.4 Monthly evolution by platform category – Drifters & others, Floats, Animals, Fixed stations

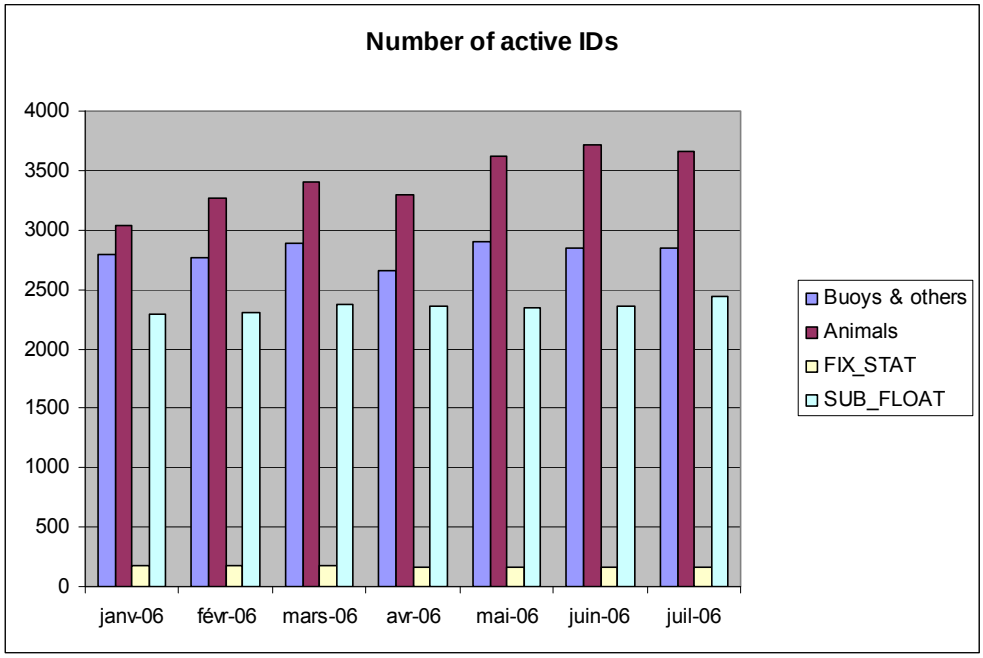


Figure 2: Active PTT evolution

Overall, the active PTTs and thus the number of transmitters in the field, is increasing with almost even numbers for “Animals” and “Buoys and others”; smaller but increasing numbers for the float family.

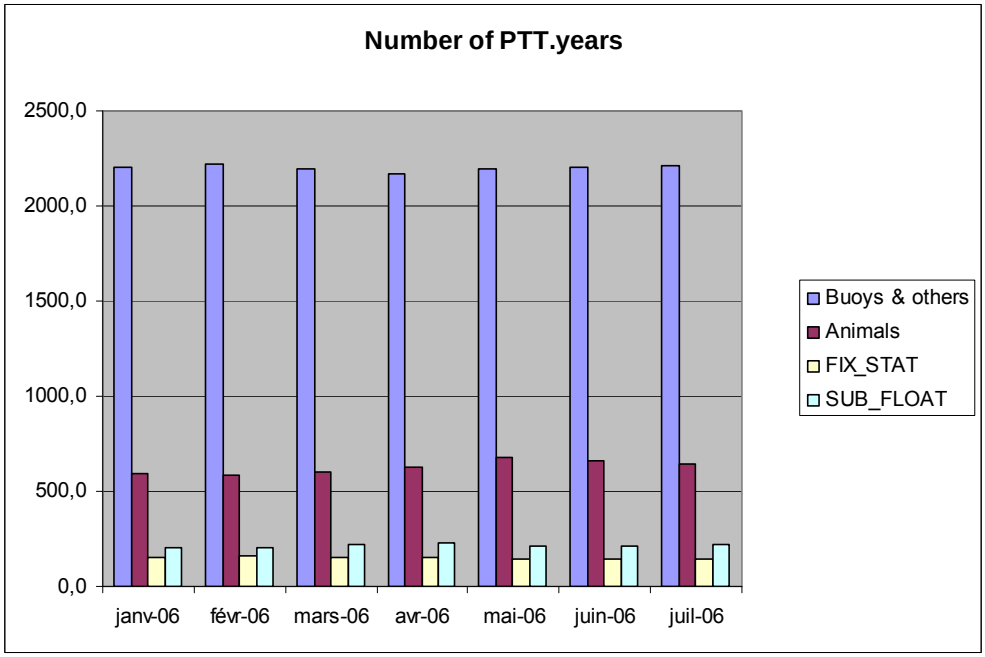


Figure 3: PTT-years evolution

It can be noticed that:

- The PTT-years picture reflects the huge difference in term of actual consumption between categories.
- “Drifters & Others” - also referred as the “Full time” category in the JTA meeting report - consume about four times more than the “Animals”, the second “top” category.
- “Floats” and “Fixed Stations” consumptions in PTT-years are similar whereas they are very different in term of volume of data transmitted, (typically 12 to 18 different messages for a float, 1 to 3 different messages for a fixed station).

2.5 Time slot analysis

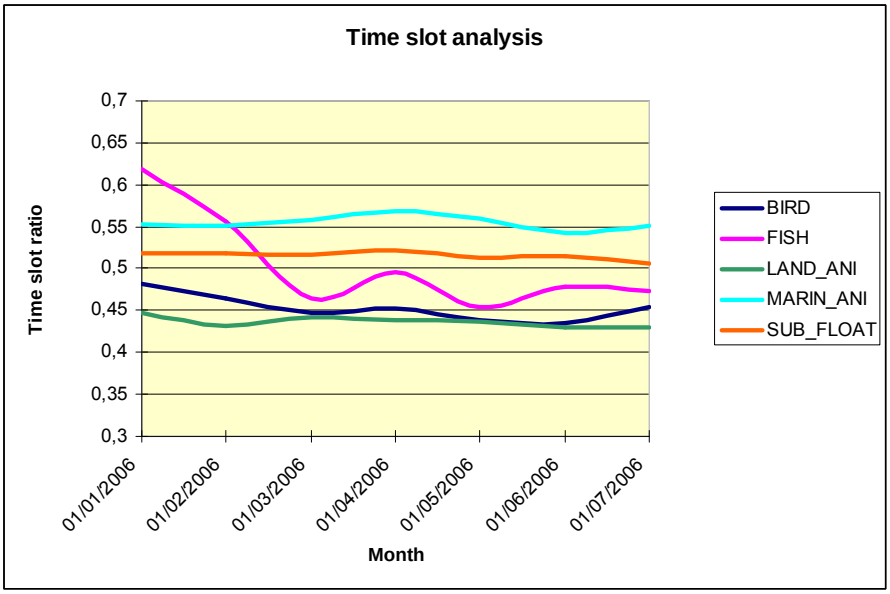


Figure 4: Average time slot level by platform category

This diagram shows the monthly evolution of the average time slot ratio per category of PTT benefiting from time slot accounting in 2006. For a 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 except "Fish" look pretty stable on average.
- The ratio for Marine animals is lower than last year (0.55 instead of 0.60).

2.6 Inactive status

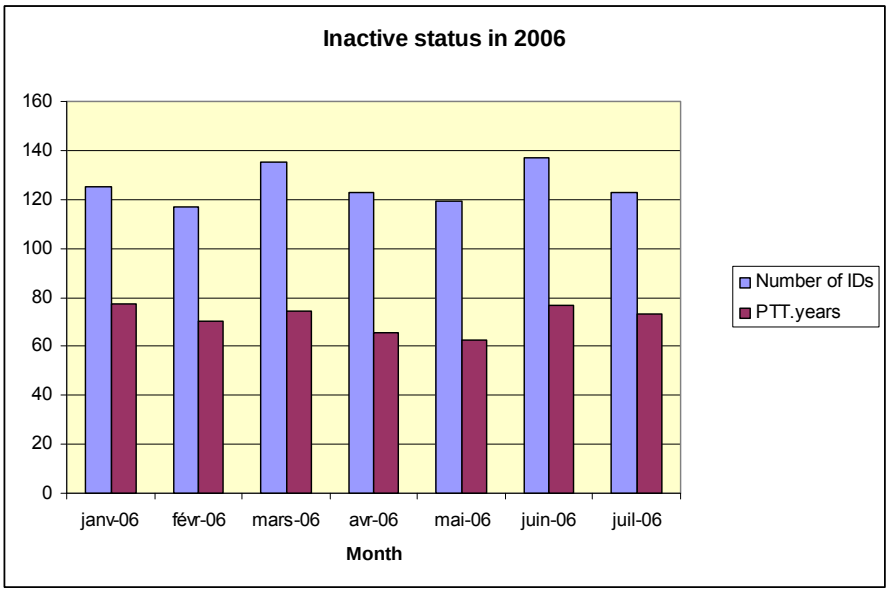


Figure 5: Inactive PTTs evolution in term of number of IDs and PTT-years

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

It can be noticed that the number of IDs in Inactive status is around 120. The PTT.year consumption is around 70.

The availability of new transmitters with solar panels may increase this trend in the future and impact substantially the satellite load. It is hence suggested to produce a recommendation to users and manufacturers to take this into account by programming their PTTs for the duration of the experiment.

3 HISTORY THE JTA PARTICIPATION FROM 1982 TO 2006

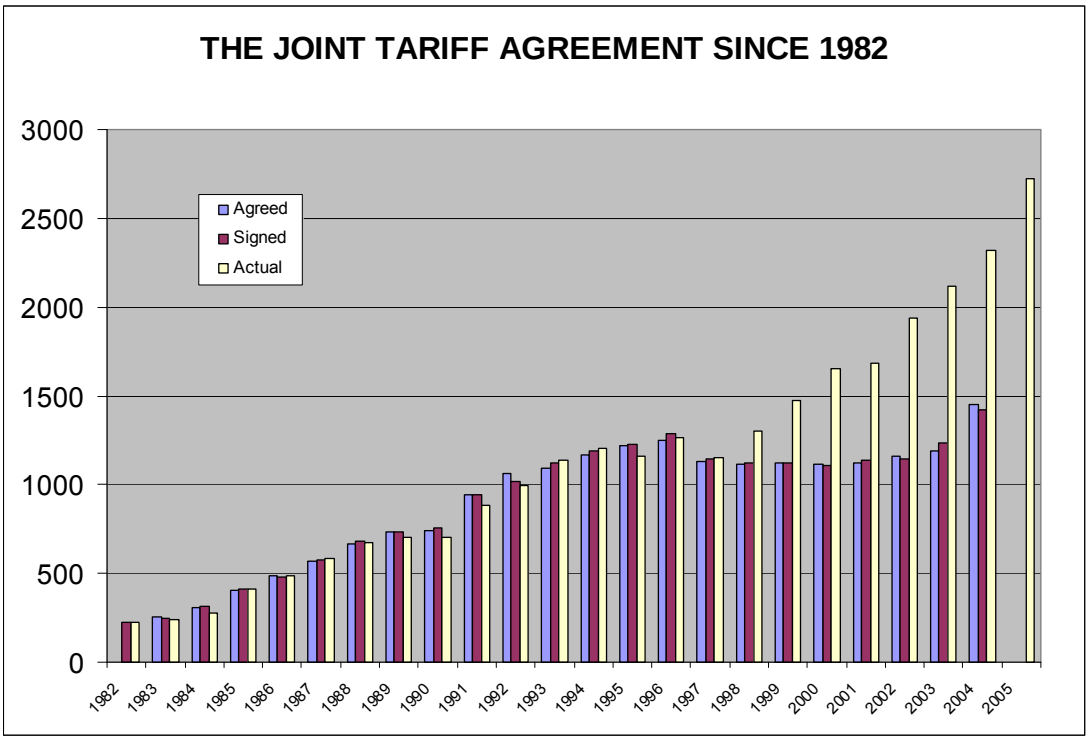


Figure 6: Agreed, signed and actual consumption in PTT.years for all countries (Since new tariff structure in 2005, only actual consumption)

ANNEX IV

Report on JTA Pilot Programme

1 SPACE SEGMENT

The next satellite is METOP-1, with the two-way capability Argos 3 instrument onboard. The launch is scheduled for the 7th of October 2006.
The Argos constellation includes 6 satellites which are used as follows:

1.1 Basic service satellites

The basic service has been provided since December 2003 by NOAA-16 (L) and NOAA-17 (M).

1.2 Other satellites

NOAA-18 (N), NOAA-15 (K), NOAA-14 (J) and NOAA-12 (D) are used as secondary satellites. Global and Regional datasets they collect are delivered according to the "multi-satellite" service characteristics.
The TIP telemetry from NOAA-15 and NOAA-16 has been on STX2 (different polarization) since 31 August 2005.
The STIP telemetry from NOAA-14 is delivered by grouping three or four orbits.
The STIP telemetry from NOAA-12 is delivered twice a day.
NOAA-11 (H) has been providing global datasets, which were also delivered through the "multi-satellite" service, until June 6th 2004. It was then decommissioned by NOAA. NOAA-11 has not delivered real-time data through the HRPT downlink since October 2001

From **Satellite status**	July 02	May 03	July 03	Oct. 03	Dec. 03	June 04	May 05	August 06
Commissioning	NOAA-17	ADEOS-2					NOAA-18	
Basic service	NOAA-16 NOAA-15	NOAA-16 NOAA-15	NOAA-16 NOAA-15 ADEOS-2	NOAA-16 NOAA-15	NOAA-17 NOAA-16	NOAA-17 NOAA-16	NOAA-17 NOAA-16	NOAA-17 NOAA-16
Multi-satellite service (additional satellites)	NOAA-17 NOAA-14 NOAA-12 NOAA-11	NOAA-17 NOAA-14 NOAA-12 NOAA-11	NOAA-17 NOAA-14 NOAA-12 NOAA-11	NOAA-17 NOAA-14 NOAA-12 NOAA-11	NOAA-15 NOAA-14 NOAA-12 NOAA-11	NOAA-15 NOAA-14 NOAA-12	NOAA-18 NOAA-15 NOAA-14 NOAA-12	NOAA-18 NOAA-15 NOAA-14 NOAA-12
Lost				ADEOS-2				
Decommissioned						NOAA-11		

Table 4: Table above displays satellites in service since July 2002

Figure 7 shows Local Equator crossing time (ascending node) and associated predictions for 3, 6 and 12 months in August 2006.

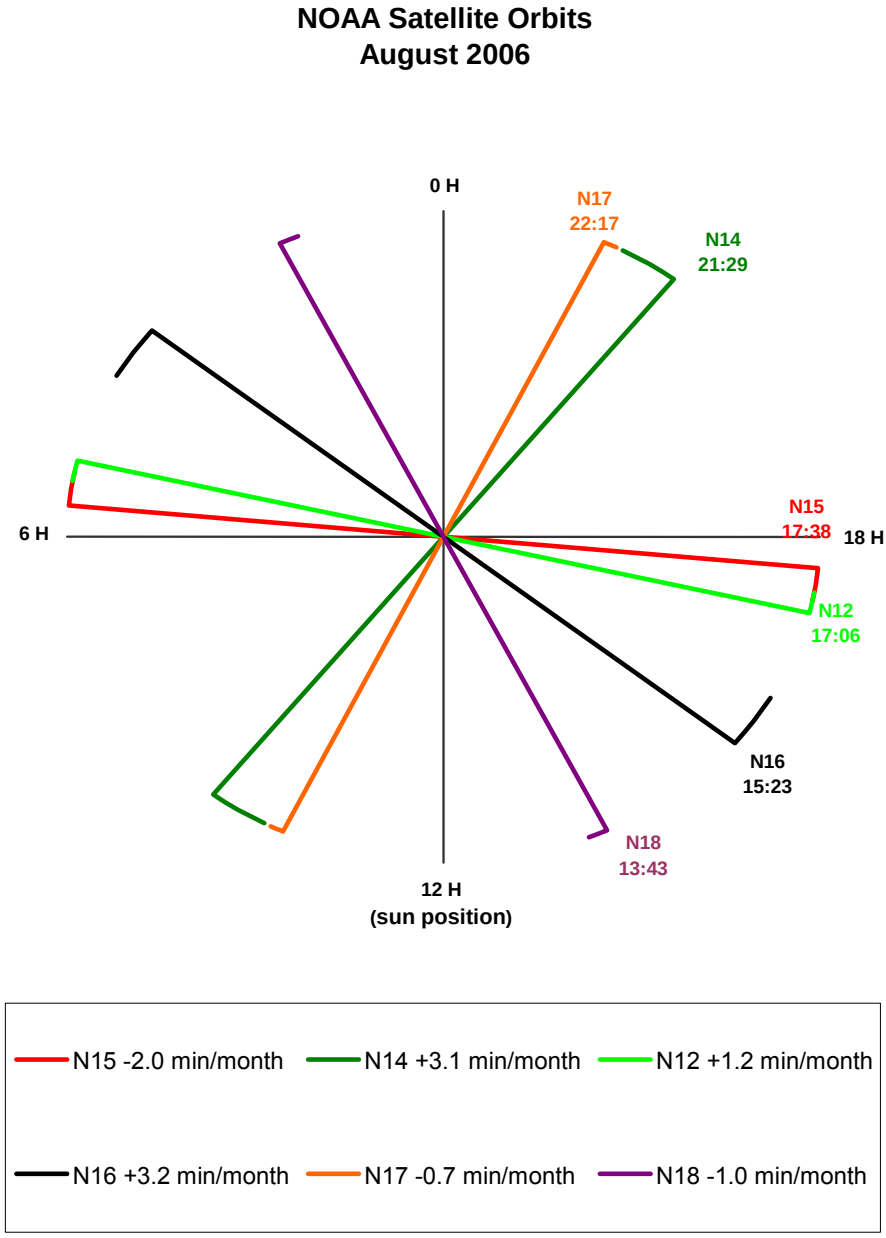
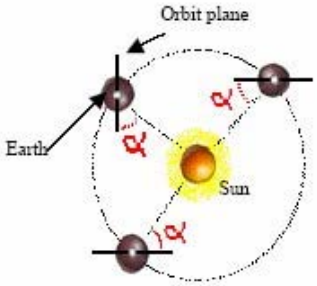


Figure 7

ABOUT ORBIT PLANES

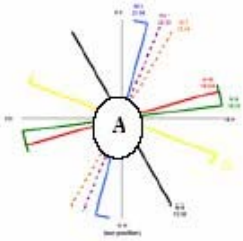
Plane and drift of a Sun-synchronous orbit



The angle (α) between the orbit plane of the satellite and the direction of solar illumination is constant if the satellite completes an orbital revolution of 360 degrees in 365.242 days (i.e., 0.9856° per day). In this case, the satellite will always be at the same angle to the Sun.
The drift of the orbit is the difference between the 0.9856° per day rate of revolution and the satellite's real period. This depends, among other things, on its altitude and on the precision with which it is initially inserted into orbit.

More recent satellites (NOAA17 and NOAA16) exhibit no drift, or very little, because they were positioned so precisely.

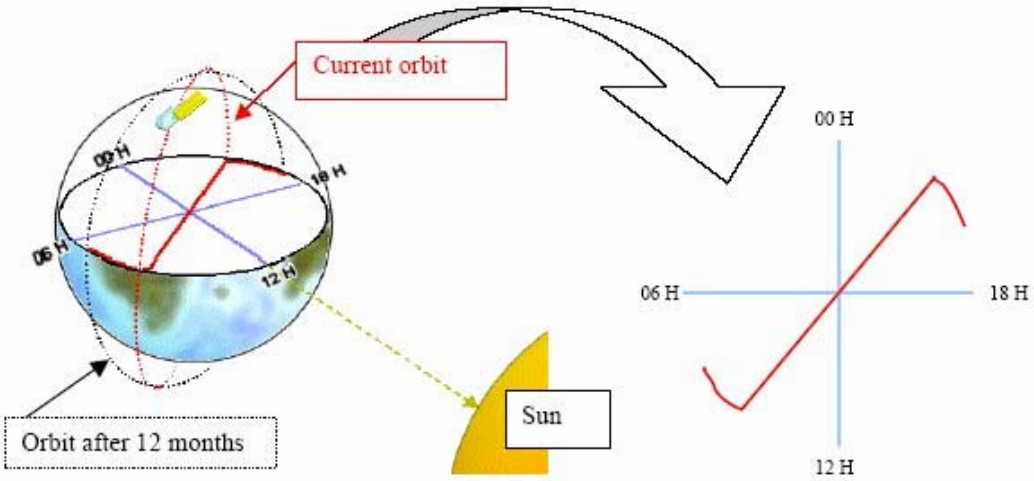
Explanation of the diagram - 4-Space segment orbit planes



The diagram shows a "bird's eye" view of the Earth. The orbit planes intersect at the North Pole (**A**). The axes are expressed in solar hours, that is, in terms of the position with respect to the Sun: for example, 12 o'clock is facing the Sun (**B**).

The orbit plane is represented by a line segment (**C**).
The drift (**D**) corresponds to the position of the edges of the orbit plane after six months (**D6**) or 12 months (**D12**), which allows us to determine the future orbit plane (**E**).

The diagram is a 2-D projection of an orbit



2 GROUND RECEIVING STATIONS

2.1 Global stations

- The two global stations of Fairbanks and Wallops deliver the STIP telemetry from the satellites NOAA-12, NOAA-14, NOAA-15, NOAA-16, NOAA-17 and NOAA-18.

- The Lannion global station, which could also acquire the STIP telemetry in some conditions, is no more used since the year 2000. Despite all our efforts to convince NOAA, it seems to be difficult to restart the STIP downloads over Lannion. With the expected launch of MetOp in October 2006, the elimination of blind orbits for N18 will be obtained with the addition of a EUMETSAT antenna in Svalbard, Norway. This event was planned and executed under the Initial Joint Polar System (IJPS) agreement between NOAA and EUMETSAT. Because the IJPS agreement covers only N18 and newer satellites, the older satellites, N17, N16, and N15, cannot use the IJPS Svalbard antenna. With this situation, engineers in OSO (Office of Satellite Operations) worked with engineers at the NOAA Integrated Program Office (IPO) to develop a concept of operations for using the IPO antenna at Svalbard. This antenna is separate from the EUMETSAT antenna, under-utilized operationally due to delays in the NPOES Preparatory Project (NPP), and is a NOAA controlled asset. It is expected that operational data recovery from N17 and N15 can be provided by October 2006. After this occurs, the elimination of blind orbits for N18, N17, and N15 will provide all Global data sets within two hours of observation.

- As regards NOAA-12, only two orbits per day are delivered by NOAA/NESDIS. It is just enough to collect the minimum amount of data from the orbitography Argos beacons required for the processing of the Argos location.

Figure 8 shows, for the 22nd May 2006, the global data set (STIP) arrival times at the Toulouse and Largo processing centers during the day. Ideally, if there was no downloading and transmitting delay, one data set should be received every 100 minutes (1h40).

2.2 Regional stations

CLS Group pursued their efforts to increase the number of receiving stations able to provide TIP data sets from the NOAA satellites. Six new stations joined the Argos network since the last DBCP session in Buenos Aires in October 2005. Four are in new places: Cape Ferguson (Australia, NOAA/NESDIS), Seoul (Korea, Korean Meteorological Agency), Taiwan (National Taiwan Ocean University), Rothera (Antarctica, British Antarctic Survey). Two were installed in Lima (Peru, CLS Peru) and Miami (FL, USA, NOAA) in addition to existing antennas.
Three antennas left the network.

There are currently 49 stations (figures 8 & 9) delivering real time (TIP, TIROS Information Processor) data sets to CLS Group. Most of them process data from NOAA-18, NOAA-17, NOAA-16, NOAA-15, NOAA-14 and NOAA-12, so good throughput times for delivery of results can be maintained.

The TIP telemetry from NOAA-15 and NOAA-16 has been on STX2 (different polarization) since 31 August 2005.

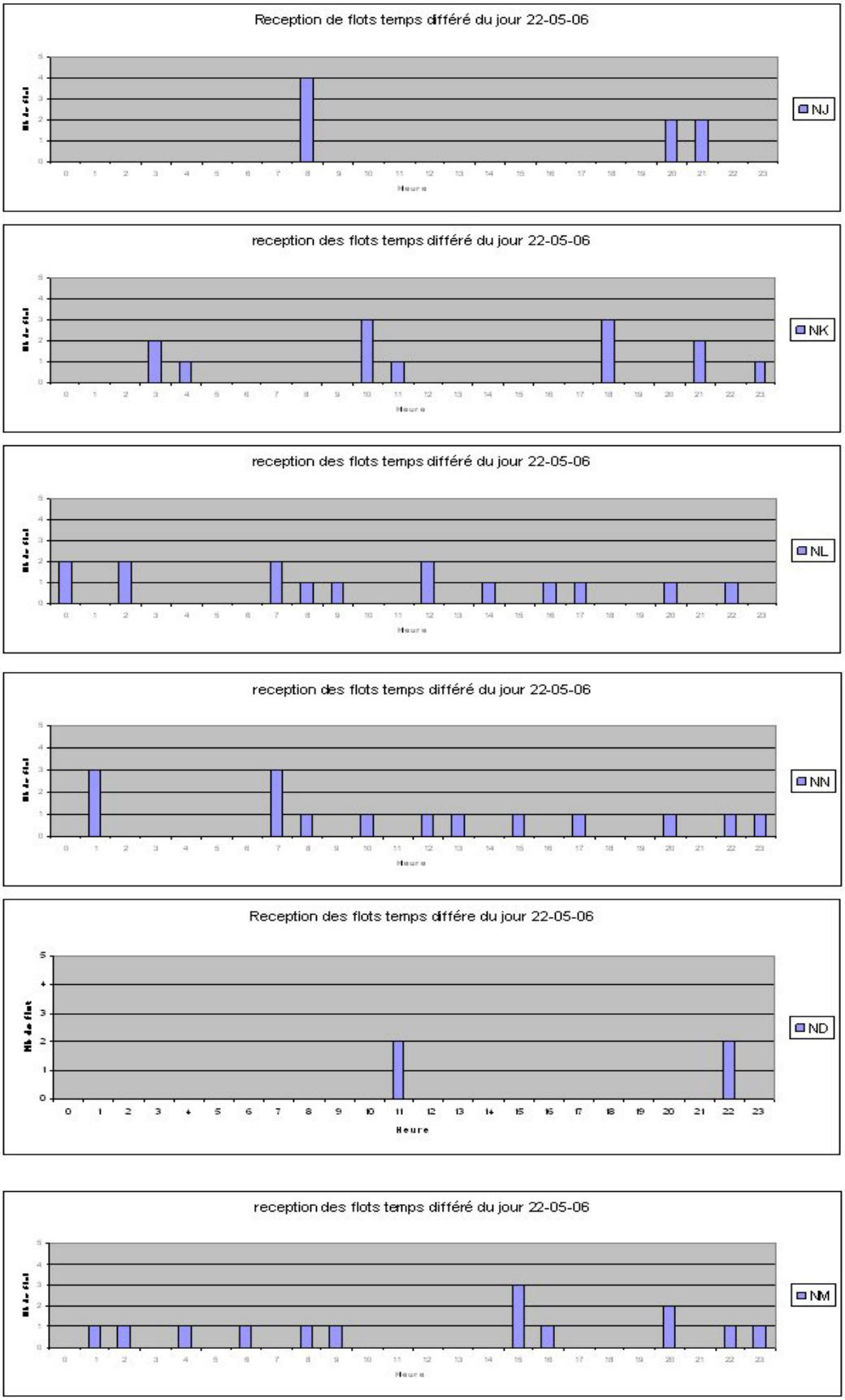


Figure 8: global data set (STIP) arrival times at the Toulouse and Largo

	Antenna	Code	Country	Operator	Possible satellites
1	Buenos Aires	BA	Argentina	INTA	**N12, N14, N15, N16, N17,**
2	Cape Ferguson	CP	Australia	NOAA/NESDIS	**, , , N16, N17, N18**
3	Casey	CA	Australia (Antarctica)	BOM	**N12, , N15, N16, N17,**
4	Cayenne	CY	France (Guyana)	IRD	**N12, , N15, N16, N17,**
5	Darwin	DA	Australia	BOM	**N12, , N15, N16, N17,**
6	Gilmore	GC	USA	NOAA/NESDIS	**N12, N14, N15, N16, N17, N18**
7	Halifax	HF	Canada	Can. Coast Guard	**N12, N14, N15, N16, ,**
8	Hatoyama	HA	Japan	NASDA/EOC	**N12, N14, , , N17,**
9	Hawaï	HW	USA	NOAA/NWS	**N12, , N15, N16, N17,**
10	Hyderabad	HY	India	ISRO	**N12, N14, N15, N16, N17,**
11	La Réunion	RN	France (Reunion Island)	Météo France	**, , , , N17, N18**
12	La Réunion	RE	France (Reunion Island)	IRD	**, , N15, , N17, N18**
13	Lannion	WE	France	Météo France	**, , , N16, N17,**
14	Las Palmas	LP	Canary Island	Las Palmas University	**N12, N14, N15, N16, N17,**
15	Melbourne	ME	Australia	BOM	**N12, N14, N15, N16, N17,**
16	Miami	MI	USA	NOAA/AOML	**N12, , N15, N16, N17,**
17	Miami	MA	USA	NOAA/AOML	**, , N15, N16, N17,**
18	Noumea	NO	France (New Caledonia)	IRD	**N12, , N15, , N17,**
19	Oslo	OS	Norway	NMI	**, N14, N15, N16, N17, N18**
20	Oahu	EB	USA (Hawaii)	NOAA	**N12, , N15, N16, N17, N18**
21	Perth	PE	Australia	BOM	**N12, N14, N15, N16, N17,**
22	Punta Arenas	PA	Chile	Meteo Chile	**, , N15, N16, N17,**
23	Riyadh	RY	AU	KACST	**N12, N14, N15, N16, N17,**
24	Rothera	RO	UK (Antarctic)	MetOffice BAS	**N12, N14, N15, N16, N17, N18**
25	Santiago	CH	Chile	Meteo Chile	**N12, , N15 , N16, N17,**
26	Singapore	SG	Singapore	SMM	**N12, , N15 , N16, N17,**
27	Tahiti	TA	France (Tahiti)	Météo France	**N12, , N15, N16, N17, N18**
28	Tromsoe	ST	Norway	KSAT	**, , N15, N16, N17,**
29	Wallops	WI	USA	NOAA/NESDIS	**N12, N14, N15, N16, N17, N18**
30	Wellington	NZ	New Zealand	Met Office	**, N14, N15, N16, N17,**
31	Athenes	AT	Greece	NCMR	**N12, N14, N15, N16, N17, N18**
32	Aussaguel	AU	France	CLS	**N12, N14, N15, N16, N17, N18**
33	Bali	BL	Indonesia	PT CLS	**N12, N14, N15, N16, N17, N18**
34	Bitung	BI	Indonesia	PT CLS	**N12, N14, N15, N16, N17, N18**
35	Cape Town	SA	South Africa	CLS/SAWB	**N12, N14, N15, N16, N17, N18**
36	Helsinki	HL	Finland	CLS	**N12, N14, N15, N16, N17, N18**
37	Las Palmas	CN	Canary Island	CLS	**N12, N14, N15, N16, N17, N18**
38	Lima	PR	Peru	CLS Perù	**N12, N14, N15, N16, N17, N18**
39	Lima	LM	Peru	CLS Perù	**N12, N14, N15, N16, N17, N18**
40	Murmansk	RU	Russia	Complex System	**N12, N14, N15, N16, N17, N18**
41	Petropavlosk	PT	Russia	Rybradiov	**N12, N14, N15, N16, N17, N18**
42	Tokyo	JM	Japan	Jamstec	**N12, N14, N15, N16, N17, N18**
43	Edmonton	ED	Canada	Envir. Canada	**N12, , N15, N16, N17,**
44	Fiji	FI	Fidji	FMS	**, N14, N15, N16, N17,**
45	Monterey	MO	USA	NESDIS/NWS	**, , , N16, N17,**
46	Seoul	SE	Korea	KMA	**N12, , N15, N16, N17, N18**
47	Shanghai	SH	China	ECSFRI	**N12, , N15, N16, N17,**
48	Sondre	GR	Greenland	DMI	**, , N15, N16, N17,**
49	Taiwan	TW	Taiwan	NTOU	**N12, , N15, N16, N17,**

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

Table 5: List of regional receiving stations (S-band antennas)

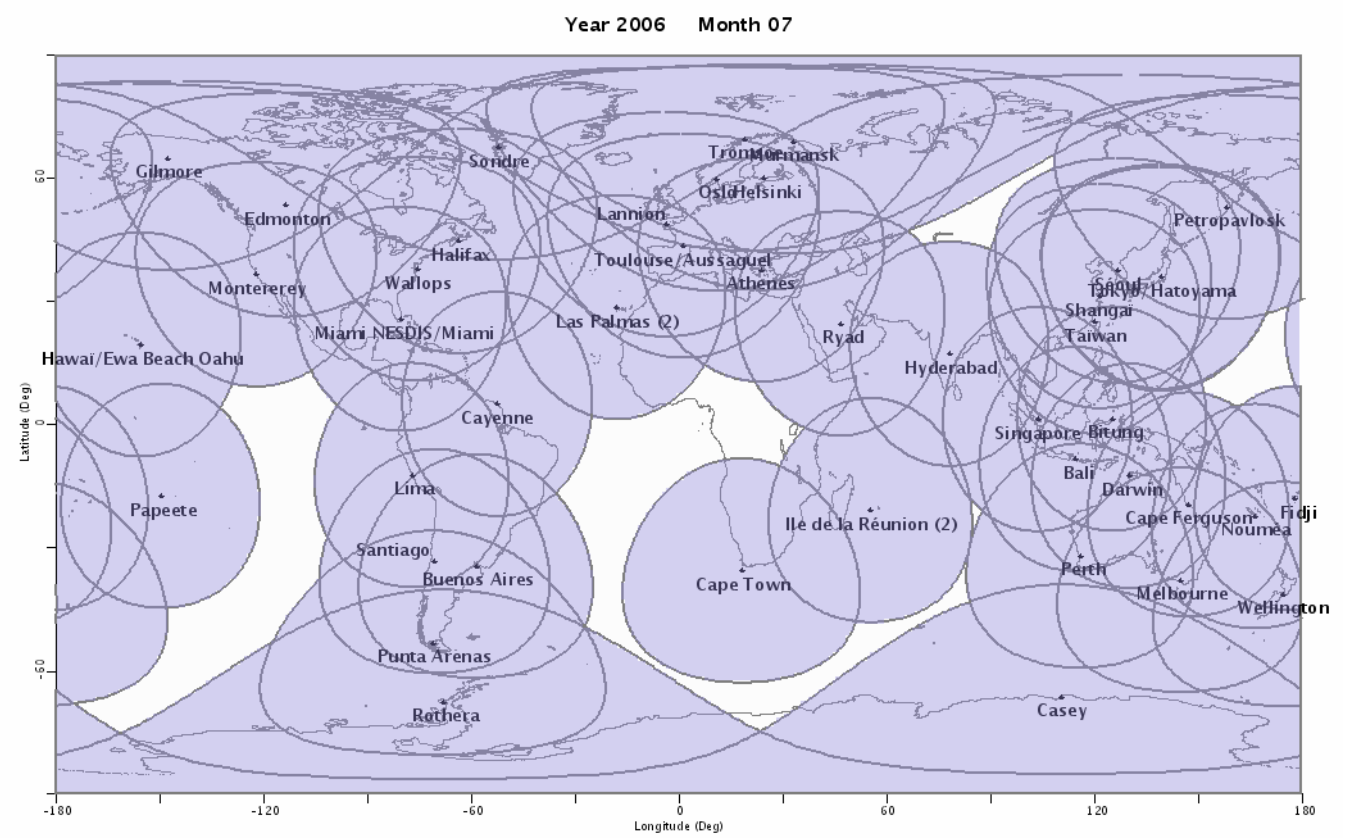
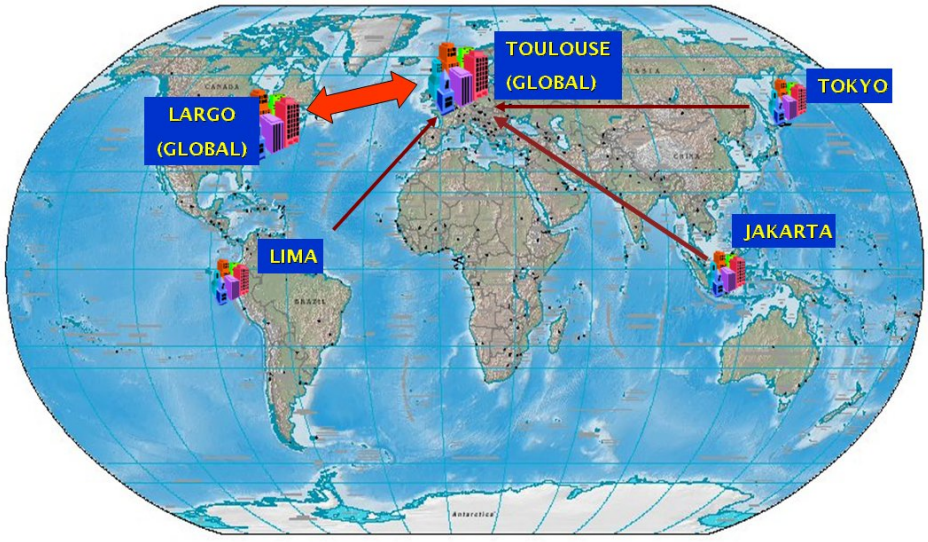


Figure 9: Argos network of regional receiving stations in August 2006

3 PROCESSING CENTERS



Global processing centers

The two global processing centers in Toulouse and Largo functioned as expected. More than 800 data sets per day (100 STIP data sets, 700 Real-time data sets) are processed in each center. Figure 2 shows the number of datasets processed per day during the month of May 2006.

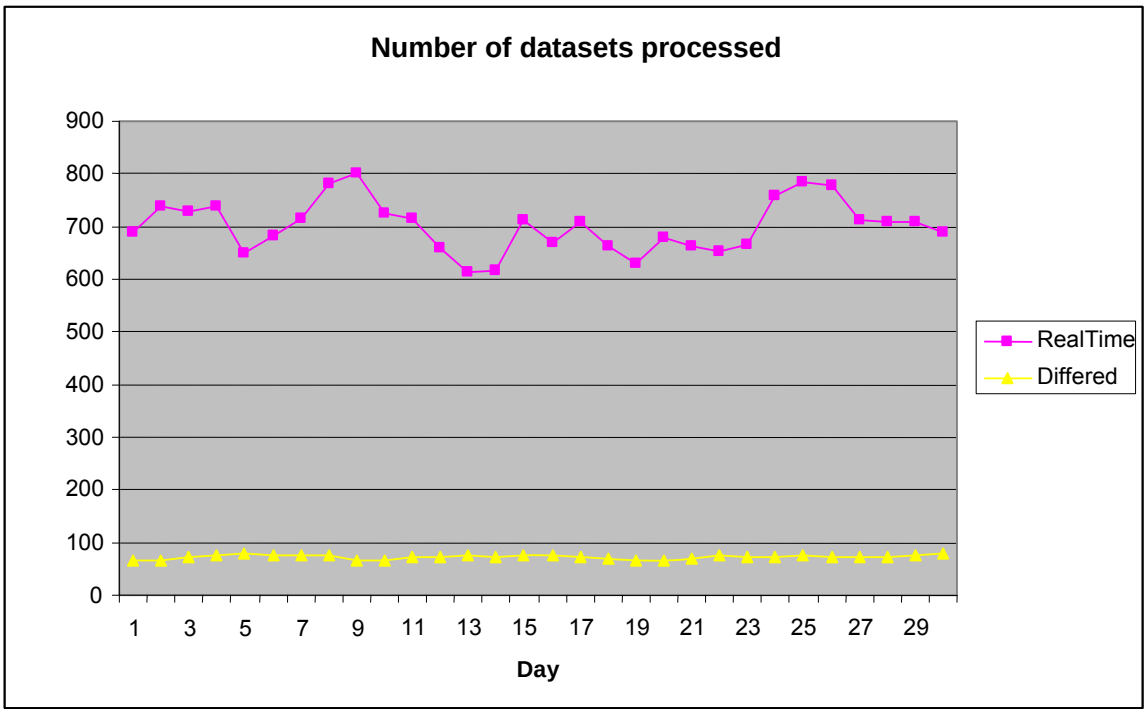


Figure 10

Operational validation of Argos2001 Phase 3A software was completed in June 2006. The new database and screens have been installed at both global User Offices.

Regional Processing Centers

The regional processing center in Tokyo (Japan) encountered hardware problems in late 2005. During the maintenance, all services were provided by the Toulouse and Largo centers. Lima (Peru) and Jakarta (Indonesia) centers were functioning normally.

All of the regional processing centers in Tokyo, Lima and Jakarta only processed data sets from stations within their region. Supplementary data providing global coverage were supplied by the Toulouse center or by the Largos center, if necessary.

Processing Centers' Activity

The number of operating Argos platforms continues to increase. In July 2006, more than 9,000 platforms were seen on average per day (figure 11). However, each of the two global centers processed data from about 17,000 individual platforms during this month (figure 12).

In July 2006, Largo and Toulouse centers processed, on average, 71,816 locations and 443,000 messages per day.

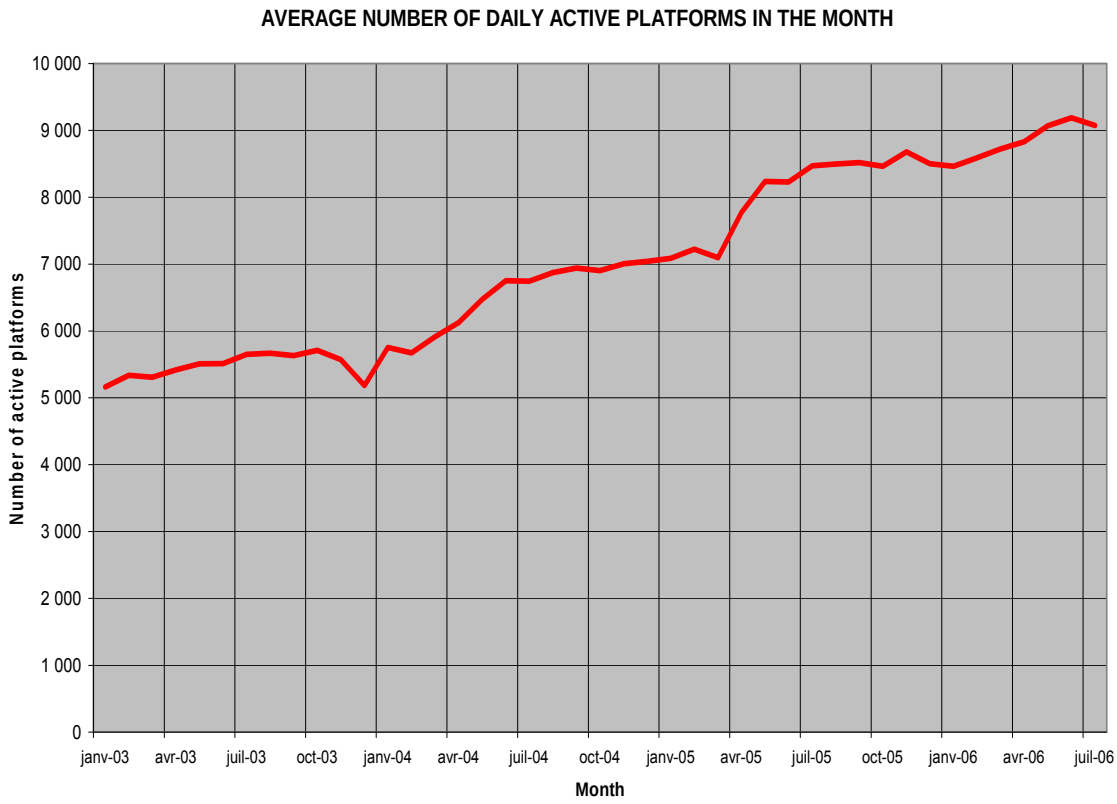


Figure 11

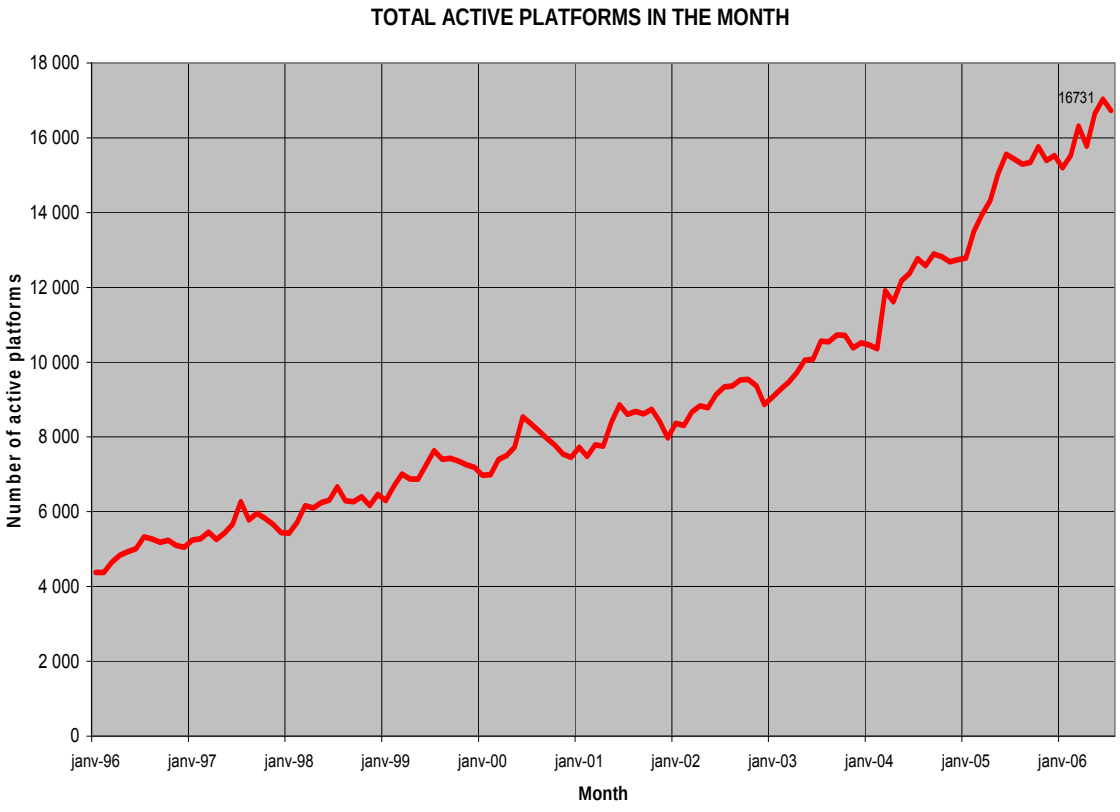


Figure 12

Figure 13 shows the ARGOS availability at CLS from September 2005 to August 2006. The Argos service was impacted by 2 electrical power problems at CLS and by the opening of ARGOS2001 Phase2. Nevertheless, the average monthly availability during this 12-month period was 99.46%. During the period when services were unavailable in CLS, CLS America Inc. was on backup.

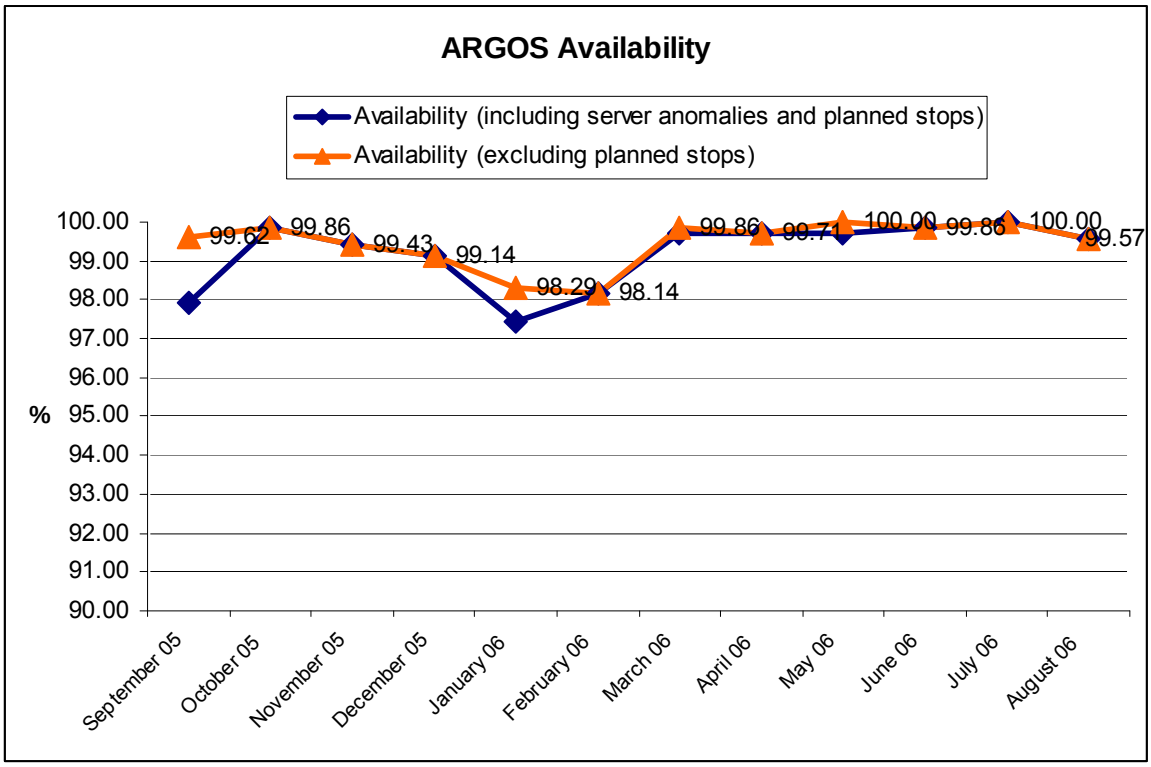


Figure 13

4 COMMUNICATION LINKS

The Internet is still the main communication link used to distribute processed data to users and to retrieve data sets from receiving stations. Security functions have been implemented like SSH, PGP.

The X25 protocol has been stopped at CLS America Inc but continues to be used by the Toulouse center to send data to a few users (less than 20) who have security concerns. This X25 protocol will be maintained during 2006.

5 THROUGHPUT TIME FOR DELIVERY RESULTS

Impact of the extension of the Argos network of regional receiving stations can be estimated thanks to study of Argos throughput times (points 2, 3, and 4 above). CLS, Service Argos throughput times for delivery of results are calculated in terms of the time for the raw Argos data to reach end users. For each message received by the satellite, Service Argos computes the data turnaround time/data availability which is the time elapsed between the recording of the message on board the satellite and processing of the same message by the global processing center.

Table 6 shows the throughput time for stored data result delivery from NOAA-18, NOAA-17, NOAA-16 and NOAA-15.

Satellite Delivery	NOAA-15, NOAA-16, NOAA-17 & NOAA-18
< 1 h	14 %
< 1 h 30	28 %
< 2 h	45 %
< 2 h 30	61 %
< 4 h	83 %

Table 6: Stored data availability for satellites NOAA-15, -16, -17 and -18

Those delivery times will be significantly improved when Svalbard station comes on line, since we will be receiving NOAA-18 blind orbits from the Eumetsat station and NOAA 17 & 15 blind orbits from the NPOESS antenna.

Table 7 below shows the throughput time for stored data result delivery from NOAA-12 and NOAA-14, two back-up satellites. The delivery of stored data is not done after every download for these two satellites.

Satellite Delivery	NOAA-12 & NOAA-14
< 1 h	3 %
< 1 h 30	6 %
< 2 h	12 %
< 2 h 30	26 %
< 4 h	62 %

Table 7: Stored data availability for satellites NOAA-12 and NOAA-14

Table 8 shows the throughput time for real-time result delivery from NOAA-18, NOAA-17, NOAA-16, NOAA-15, NOAA-14 and NOAA-12 and acquired by the 44 HRPT receiving stations.

Satellite Delivery	NOAA-12, NOAA-14 NOAA-15, NOAA-16 NOAA-17 & NOAA-18
< 10 minutes	12 %
< 15 minutes	38 %
< 30 minutes	82 %
< 45 minutes	89 %

Table 8: Real-time data availability

Figure 14 shows, per 30°x30° square, the real time mean data availability delay and the percentage of data received in real time via the 49 regional stations during the month of July 2006. It also shows the differed time mean data availability delay for the rest of the data.
The ocean regions where efforts must be done to provide more data in real-time are:

- South Atlantic Ocean,
- South-East Pacific Ocean,
- North of Indian Ocean (Hyderabad station is not delivering data on a regular basis for the time being).

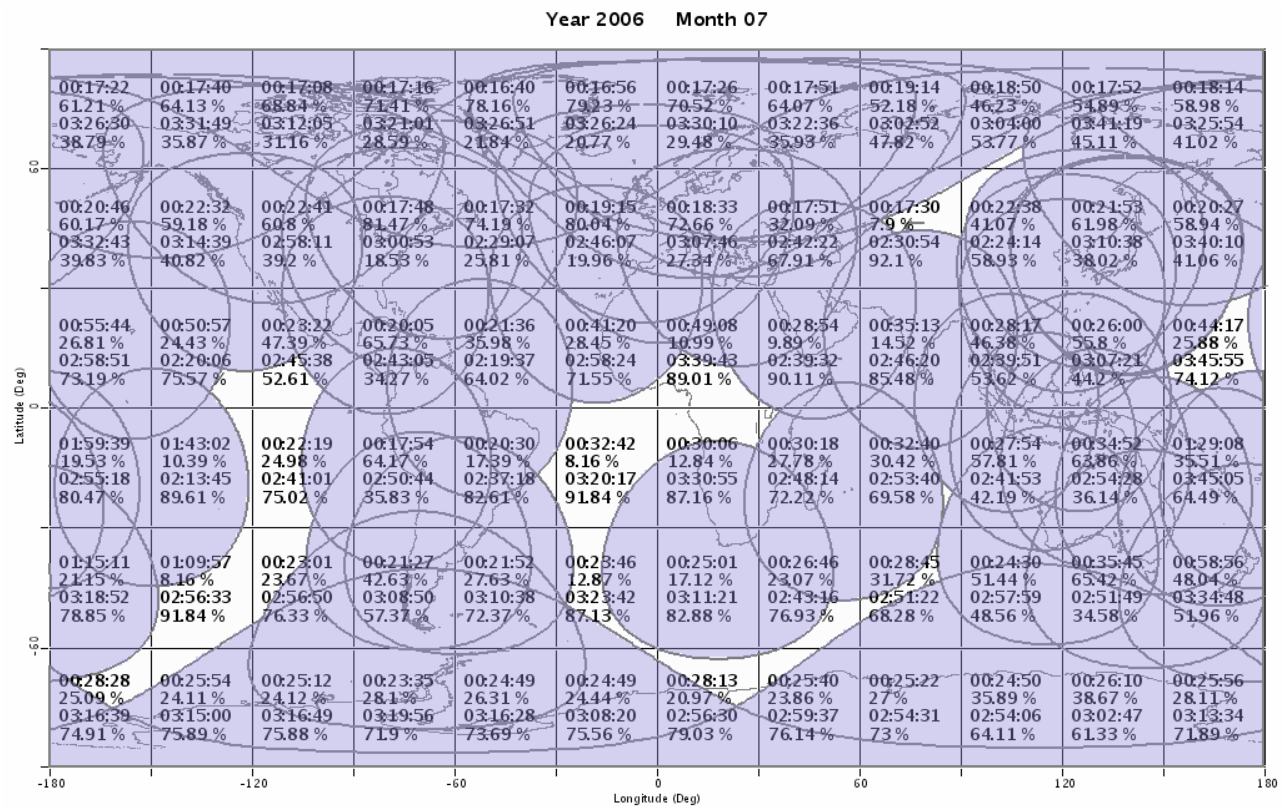


Figure 14

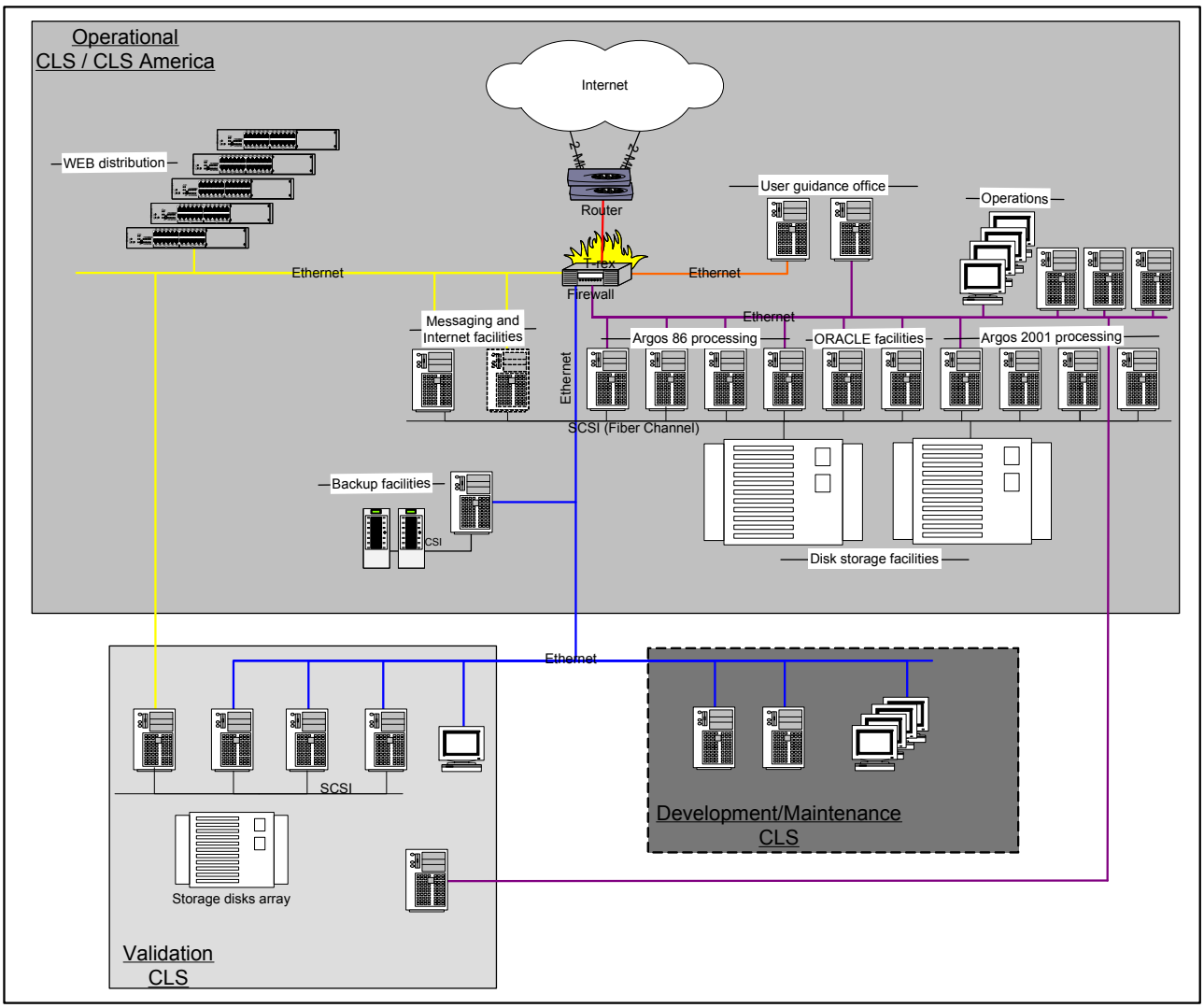
30°x30° squares
1st row: Real time mean data availability delay
2nd row: Percentage of data received in real time
3rd row: Differed time mean data availability delay
4th row: Percentage of data not received in real time

ANNEX V

SYSTEM IMPROVEMENTS

1 HARDWARE AND SOFTWARE CONFIGURATION

1.1 Hardware Configuration



The architecture implemented in 2004 for the Argos 2001 application has been slightly modified to add three new Linux servers to run the software associated to the phase 3 of Argos 2001.

Other improvements included:

Data backup system has been renewed

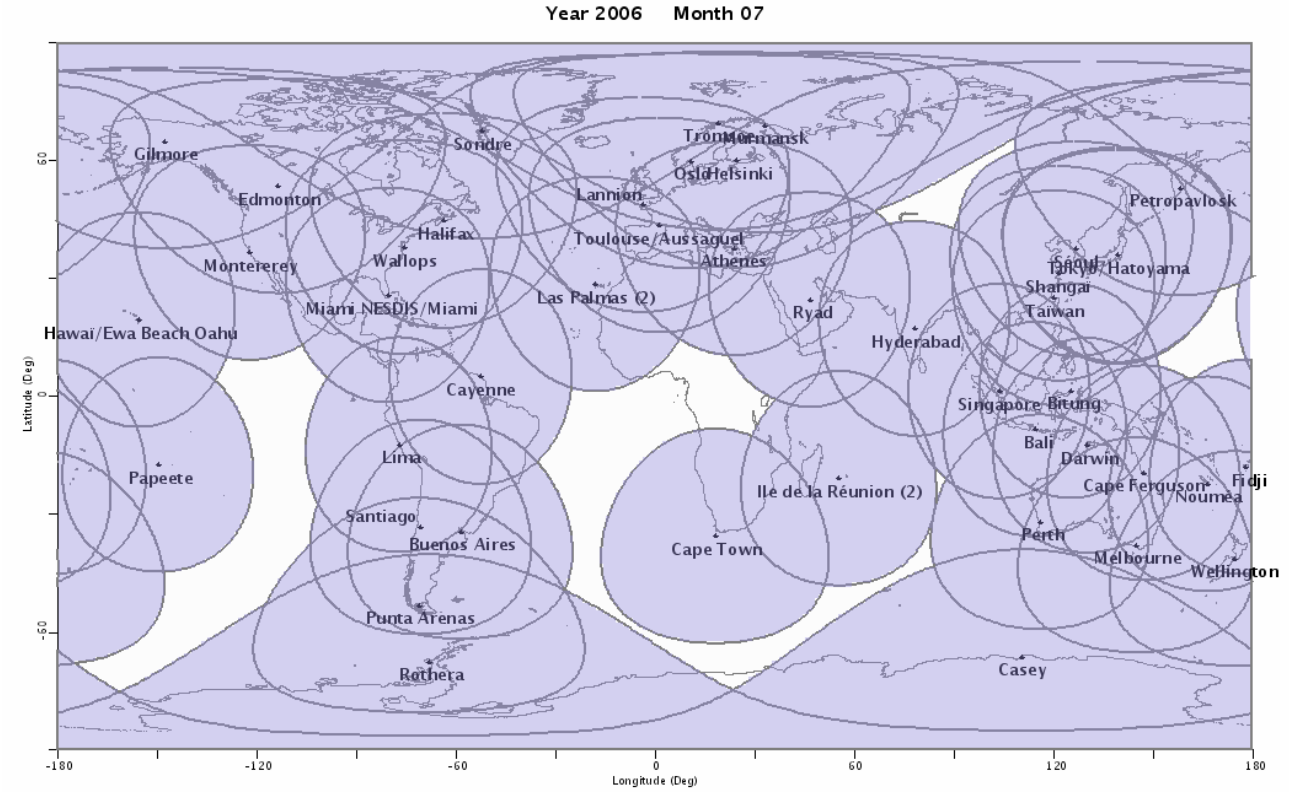
Local network has been upgraded

The project "Disaster recovery plan" is under development. A second computing room, able to house a part of CLS computing facilities, has been provided by CNES. The installation of the redundant processing center is progressing well and should be completed at the beginning of 2007.

1.2 Ground Segment Architecture

Six new stations were added to the Argos network during the year. Four are in new locations: Cape Ferguson (Australia, NOAA), Seoul (Korea, Korean Meteorological Agency), Taiwan (National Taiwan Ocean University), Rothera (Antarctica, British Antarctic Survey). Two were added in Lima (Peru, CLS Peru) and Miami (FL, USA, NOAA). Three antennas were removed from the network.

The Argos stations network now comprises 49 antennas.



1.3 Software configuration

CLS continues to focus most of its software development efforts on the Argos 2001 and Argos 3 projects – see paragraph "2. Projects". At the same time the team regularly works on corrective software maintenance and upgrades that are vital to continue meeting user requirements.

1.4 Regional processing centers

The three regional processing centers (Tokyo, Lima and Jakarta) operated without any major hitch in 2005-2006.

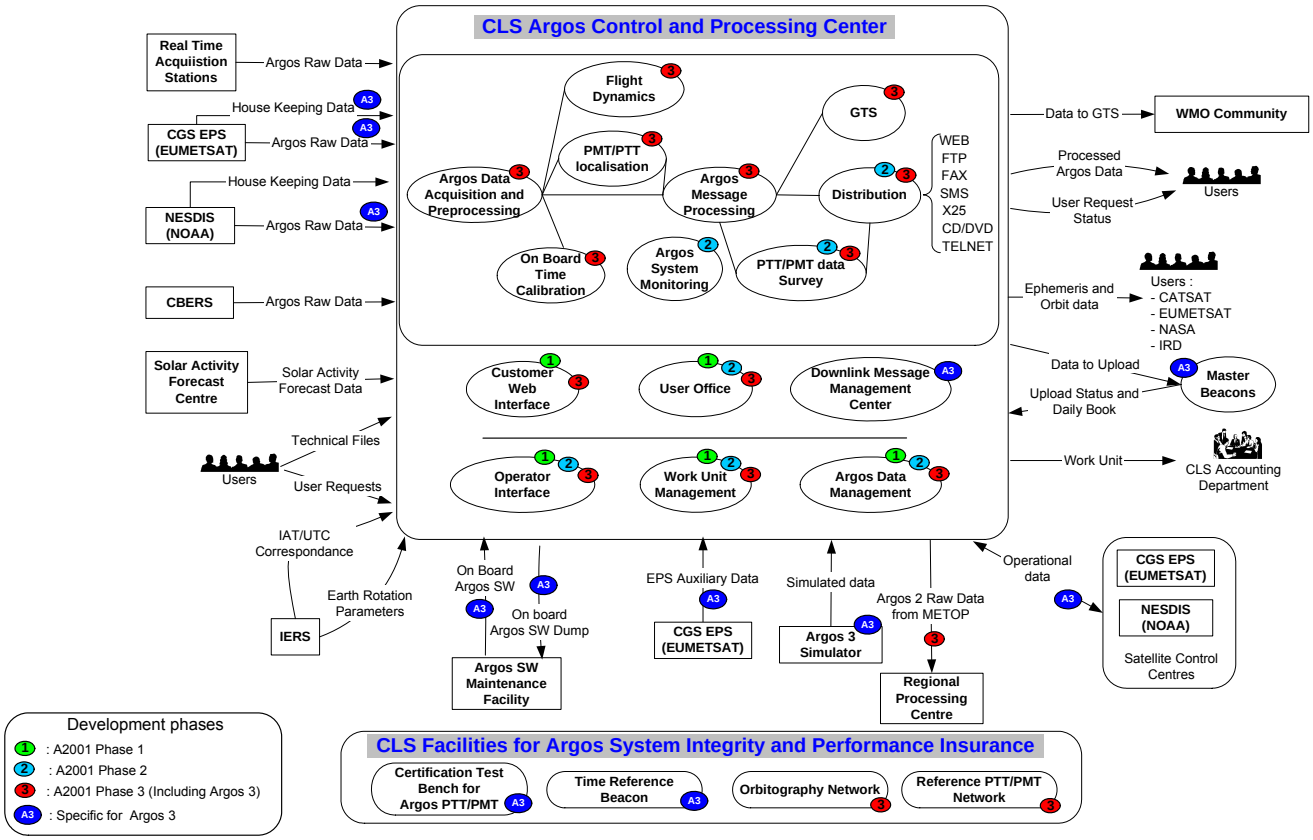
In Melbourne, there is no longer a regional processing center but the User Office is still operational for regional users, mainly for Australia and New Zealand.

2 PROJECTS

The Global Argos Control and Processing centre is being improved through two projects:

- Argos 2001 project (see chapter 2.1),
- Argos 3 Ground Segment project (see chapter 2.2).

The figure below gives an overview of all components and the interface of the processing center which have been added or modified during the development described in the following paragraphs.



2.1 Argos 2001

The purpose of the Argos 2001 project is to upgrade the entire Argos processing system. This ambitious project is vital for the long-term continuity of the Argos system and to better serve users.
This project is scheduled in three phases:

Phase I: Development and implementation of a new user interface allowing users to access data and view and update technical files via a Web server. The System Use Agreements database is also implemented during this phase. Data will be stored and managed by a database management system designed to be responsive to users' needs.

Phase II: Improvement and development of value-added services.

Phase III: Redesign of the core Argos processing system. This phase has been subdivided into 2 sub phases:

- IIIA : Redesign of Argos processing chain
- IIIB : Redesign of GTS processing chain

Current status:

Phase I:
The Contact List Management application is operational since 2000.
The User Office application is operational since 2001.
The first data distribution website opened to users in 2003. A second website, more user-friendly and compatible with the latest internet techniques, should be operational before the end of 2006.

Phase II:
The value-added services are operational since May 2004.

Phase III:
Requirement specifications were reviewed in July 2003.
Software specifications were reviewed in May 2004.
The technical qualification for the complete ground segment started in January 2006.
Phase IIIA will be put in operation in January 2007 and Phase IIIB in mid-2006.

2.2 Argos 3 Ground Segment (SSA3 Project)

In March 2003 started a new and major project for Argos named: SSA3 (Argos 3 Ground Segment). This project aims to take into account all the changes in the current Argos ground segment brought by the third generation of Argos instruments. It includes the downlink and the new format for the uplink messages (new modulation, high bit data rate…) as well as the interface with EUMETSAT.
The sub-systems of the Argos 3 Ground Segment development shall be completed and validated before the launch of the first METOP satellite, which is scheduled on October, 7th 2006.
This project is driven in parallel with the Argos 2001 Phase III project.

The Project covers the 4 following developments:
- Software evolution of the Argos Control and Processing Center (APC). It includes all sub-systems modified due to the Argos 3 capabilities and characteristics,
- Time Reference Beacon,
- A new network of master beacons (High data rate platforms),
- Argos PTT/PMT test bench.

2.2.1 Argos Control and Processing Center

The Argos Processing center is made of several sub-systems. Each sub-system is independent regarding the integration and validation of the center. These subsystems are:
- ACQ/PTR: it acquires the mission telemetry from the regional antennas or the global receiving stations. Then, it processes the telemetry to provide the other subsystems with “clean” and homogeneous Argos telemetry.
- LOC: it calculates the platform localization by using the frequency measurements made by the instruments.
- DAT/ORB: The relation between the on board time and UTC, used to time stamp the Argos messages, is assessed by the DAT subsystem. ORB is in charge of the production of ephemeris data used to localize the satellites.
- TRM and GTS are two subsystems related to A2001 Phase III. They provide new capabilities to the users for encoding and distributing the data they transmit through Argos.
- DMMC: It is the Downlink Message Management Center. Due to the failure of ADEOS II mission, DMMC is now fully dedicated to Argos 3 instrument. It has been fully delivered in September 2005.

The integration tests with EUMETSAT started in July 2005. The data are now received from EUMETCAST.

The Integration, Validation and Verification (IV&V) phase started in April 2005. The full IV&V of the Argos 3 ground segment is done in parallel with the IV&V of the A2001 Phase III. It started in December 2005 and it is still in progress. All functions involved in Argos3 telemetry processing and downlink message management will be ready for the launch.

2.2.2 Time Reference beacon

A new generation of the Time Reference beacon has been specified to meet the new requirements of the Argos 3 instrument. The Factory Acceptance Test took place in June 2004. This beacon has been operational since April 2006.

2.2.3 Master Beacon

The Master Bacon, compliant with Argos 3 instrument, has been accepted by the CNES in March 2004. A master beacon was set up in Svalbard in September 2005. A second one will be installed at Fairbanks in September 2006.

2.2.4 Certification Test Bench for Argos PTT/PMT

This facility is used to check the new PTT/PMT series regarding the Argos general specifications in order to avoid that they disturb the on-board Argos equipment operations and the Argos system performance. The test equipment has been accepted by CNES and has been nominally used for certification since September 2005.

2.3 Regional processing centers

The three Argos regional centers (Lima – Peru, Jakarta – Indonesia and Tokyo – Japan) have been working properly in 2005. A few modifications have been made in 2005 to connect the regional centers to the new user guidance office only implemented in the global processing centers of Toulouse and Largo.

2.4 PTT/PMT for users

The Argos III Project includes a new key link between sensors and users. This new unit, also called PMT (Platform Message Transceiver), will work as a modem with the acquisition of data and their management to communicate with the satellite constellation. This management includes:

- the transmission of uplink messages using the satellite pass prediction attached with the compatible modulations,
- the reception and processing of the downlink messages (commands, predefined messages, satellite acknowledgement…),
- the communication with the platform for the acquisition of sensors and the delivery of an acknowledgement when they have been all transmitted and acknowledged by satellites.

This new tool will give users new performances as soon as the satellite will be declared operational.

Using the feedback from ADEOS II, CLS has decided to run the “PMT Project” with two main targets:

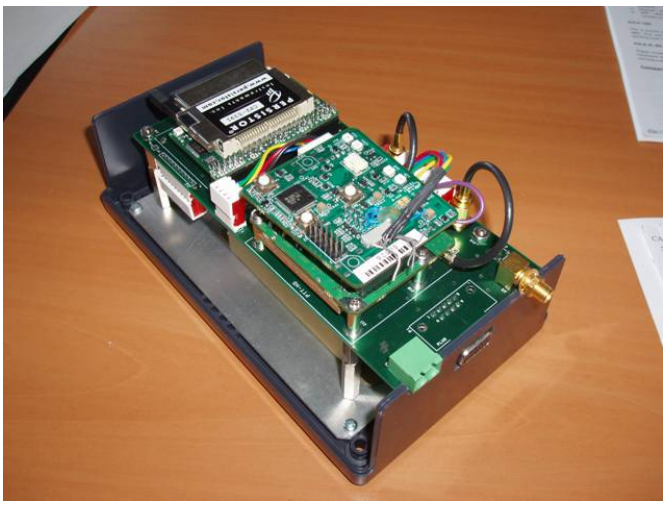
- To get some “PMT demo units” or first generation PMTs available as soon as the first METOP satellite is declared operational.
- To work on “Industrial PMT RF modules”.

A. First Generation PMT

Very first PMTs were developed in 2002 / 2003 by Bathy Systems (Boston, USA) in collaboration with Seimac Ltd (Halifax, Canada), a major PTT manufacturer. These units were working only on a BPSK 400 bits/sec. uplink and a BPSK 200 bits/sec. downlink. They were built with existing modules making the end product rather large and expensive but fine to run demonstrations. This work, as the collaboration between different manufacturers, gave CLS the opportunity to order in May 2005 a set of 80 “First Generation PMTs” to Seimac Ltd, with some enhancements to fit with Argos 3 new features.

These enhancements concern a new digital transmitter to run the PMT on both BPSK and GMSK modulations.

Seimac has already delivered a prototype unit of this PMT which is currently under evaluation at CLS. A set of 80 units will be available by September 2006.



B. Industrial PMT RF module

Part of the success of the Argos 3 project will be based on the availability of low cost, low consumption and tiny “PMT RF modules”. These modules have the same functions as the First Generation PMT demonstration units but they are designed “from scratch”. In other words, the complete product is designed to be a simple single “electronic board”. This design will reduce the size, the cost, the complexity of the product (less controllers and interfaces) and the consumption.

This work started in early 2005 with technical and marketing studies. The kernel of the product is clearly identified. It is made of a receiver, a transmitter, a relay to switch the unique antenna from reception to transmission and a controller to manage the satellite protocol and to support the communication with outside.

The financial goal is to make PMT units available at cost equal or lower than the current one-way PTTs.

CLS issued late 2005 a tender. In February 2006, two providers were selected: Kenwood (Japan) and ELTA (France). The aim is to get within a year (February 2007) tiny, low cost

PMTs to provide users with as industrial Argos 3 solutions. The developments are now well on their way and preliminary results are positive.

3 REVIEW OF USERS REQUIREMENTS

3.1 Data Buoy Cooperation Panel requirements

3.1.1 Keep NOAA-12 and NOAA-14 in operation

***Requirement**: The Argos data relayed by NOAA 12 and NOAA 14 are of considerable value as part of the multisat service. The DBCP has made a strong request to keep NOAA 12 and 14 in operation.*

Status: NOAA/NESDIS convened a POES constellation meeting in July 2005 at which decisions were to be made regarding the entire POES constellation. As of this writing a decision has been postponed until the next meeting which will be in October 2006.

3.1.2 Activate Svalbard Ground Station.

***Requirement**: The lack of a capability to download blind orbit data from the NOAA Polar Orbiting Satellites contributes significantly to the Argos data delays on the GTS. A possible solution to this problem is the early activation of the Svalbard NPOESS ground station to enable it to capture blind orbit POES data.*

Status: With the expected launch of MetOp in July 2006, the elimination of blind orbits for N18 will be obtained with the addition of a EUMETSAT antenna in Svalbard, Norway. This event was planned and executed under the Initial Joint Polar System (IJPS) agreement between NOAA and EUMETSAT. Because the IJPS agreement covers only N18 and newer satellites, the older satellites, N17, N16, and N15, cannot use the IJPS Svalbard antenna. With this situation, engineers in OSO (Office of Satellite Operations) worked with engineers at the NOAA Integrated Program Office (IPO) to develop a concept of operations for using the IPO antenna at Svalbard. This antenna is separate from the EUMETSAT antenna, under-utilized operationally due to delays in the NPOES Preparatory Project (NPP), and is a NOAA controlled asset. It is expected that operational data recovery from N18, N17 and N15 can be provided by October 2006. After this occurs, the elimination of blind orbits for N18, N17, and N15 will provide all Global data sets within two hours of observation.
The data should start flowing on an experimental basis daily for about three months.

3.1.3 Acquire Data from Brazilian LUT's

***Requirement**: In order to enhance the timeliness of Argos data, particularly in tropical areas, a tentative cooperation with the Brazilian Space Agency is still a work in progress. In addition to the possibility of processing data from the Brazilian DCS within the Argos system, there was the additional possibility of using Brazilian LUT's to obtain standard Argos data that would improve observational coverage for the ISABP, amongst others.*

Status: Only one satellite, SCD2 is still delivering data. Further to oral agreement between INPE and CLS, real time SCD2 datasets are downloaded by INPE station in Cuiaba (central Brazil) and then transferred to Lima to be processed by CLS Peru that is interested in real time fishing vessel data. Data includes only data messages since the INPE system do not provide locations. No processing is done by global processing centers at this step. This capability could be implemented upon completion of the new Argos processing Phase III-B, end 2006, provided SCD2 is still in operation.

3.1.4 Various GTS sub-system Enhancements.

GTS will be included in the new Argos 2001 processing system

When Phase IIIB is operational, the GTS sub-system will be an entire part of the full Argos processing system. All data (Argos outputs and GTS formatted data) will be delivered by the same system.

BUFR Encoder

***Requirement**: Under Agenda Item 8.2 of DBCP 19 the panel agreed that it would be desirable to employ data compression to achieve significant reduction in message length. It therefore requested the Chairman to bring a recommendation to the Argos JTA to enhance the current GTS BUFR encoder to include data compression.*

Status: The implementation of the compression of the BUFR files was completed in September 2005.

TAO Salinity computation

A new algorithm has been developed for the GTS sub-system to accommodate the new TAO mooring data formats and assemble salinity and temperature observations for a given level, prior to the QC step. It was implemented in mid-October 2004 and after a PTT declaration tuning run properly end October.

Duplicates

In some circumstances, the Argos GTS time tagging process generated duplicated observations. This impacted some BUOY and TESAC bulletins. A routine has been developed to suppress these duplicates. It was implemented in September 2005 and corrected in Spring 2006.

ARGO, APEX 28-bit format

The new code concatenates the 40 last bits of the previous float message to the next message, then processes it. S-T-D samples are then complete.
This was implemented in September 05 and definitely corrected in June 06.

ARGO – AOML redundancy

Action pending.

ARGO – Speeding-up the data distribution

The new routine picks up the total number of data samples transmitted coded in the first message and sums up the number of data samples received. As soon as all the data samples are received, the profile starts being processed.
In case a message is missing, the profile is calculated, using all messages available, after the pre-set duration has elapsed (18 hours). This routine was implemented in October 2004. Declaration tunings were applied in 2005.

ARGO – Meta data dissemination to Ifremer or others

All ARGO data processed by the CLS GTS subsystem are delivered to Coriolis (at Ifremer) via ftp.

VARIOUS FORMATS and GTS transmission

CLS has been working with IABP coordinator to accommodate Ice Mass Buoys (IMB) data processing – using dedicated Campbell formats – and data are now sent onto GTS.
CLS has been working with Bill Scuba, SCRIPPS, to adequately send onto GTS data from hurricane buoys. This work leaded to the design of an enhanced data transmission format and related GTS processing template. Tests are successful. Deployments are forecast for September.

3.1.5 Falklands/Malvinas LUT

UK and South Africa will be invited to report on the current status of establishing a data telecommunication link for Argos TIP data from Falklands/Malvinas Islands LUT to the Argos network. The UK will be particularly invited to report on the current status of the 64K telecommunication line to its Met Office headquarters in Exeter and whether appropriate software to transfer Argos TIP data via FTP and through local firewall has been written.
DBCP chairman D. Meldrum reminded UK Met Office about this topic. A reply should be forthcoming soon.

3.1.6 St Helena Island LUT:

CLS will install an antenna in Gabon in September 2006. This will increase the real time coverage in South Atlantic. There is currently no LUT receiving station on St Helena Island but UK Met Office is ready to maintain and operate one. CLS just replaced the Peruvian antenna with a METOP compatible one and is thinking about using the previous LUT for St Helena. An update on this topic will be provided at the DBCP-JTA meeting.

Further South in the Atlantic, the South African Weather Service asked CLS for a proposal for 3 antennas: one to update Cape Town antenna and make it compatible with METOP, one for Gough Island and one for Marion Island in the Sub Antarctic Ocean. No decision is known for the moment. The project seems to have been postponed to 2007.

3.1.7 Easter Island LUT:

No antenna, no infrastructure available.

3.2 Issues arising from the Argos Operations Committee

CNES is planning to convene a workshop, no later than early 2007, in order to discuss the Argos-4 development process, especially the potential schedule and technical capabilities deriving from user requirements.

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ANNEX VI

REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS

4 REPORT AND RECOMMENDATIONS FROM THE OPERATIONS COMMITTEE

40th Operations Committee (June 2006)

G-1-1. Report on JTA Meeting (see exhibit # 23)

Yves Tréglos presented the report on JTA meeting.

Action
The Operations Committee is invited to note the report on the 25th Meeting of the Argos Joint Tariff Agreement (Buenos Aires, 24-26 October 2005) and advice on future actions as appropriate.

Discussion

1. The 24th meeting on the Argos JTA was held in Buenos Aires, Argentina, from 24 to 26 October 2005, at the kind invitation of the Servicio Meteorológico Nacional (SMN) and Servicio de Hidrografía Naval (SHN) of Argentina. Nine 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. One of the key issues of the meeting was to assess the pilot programme for the new tariff structure, adopted in principle at JTA-XXIV, which most ROCs had agreed to join (except Canada, China and United Kingdom) for testing during 2005.
3. The meeting had to clarify a misunderstanding between CLS and the participants in JTA-XXIV regarding the way the time-slot mechanism would be applied to various categories of platforms. It was made clear that all platform categories should be involved, provided that CLS be allowed to modify a coefficient in the tariff formula from 2007 onwards, should a financial problem occur (strong decrease in CLS revenue) following that clarification.
4. Otherwise, and notwithstanding various proposals to improve the new tariff structure, the meeting finally agreed that all JTA members would join in the new tariff scheme from 2006 onwards, on the understanding that the various figures presented would be tested during the coming year and might be adjusted as necessary.
5. Among User Requirements, the question of the "blind orbit" was raised once more, and the NESDIS representative at the meeting, Mr. Darrell Robertson, gave all necessary explanations about activities underway to solve the problem.
6. At the chair's initiative, a new agenda item was introduced to review "the future of the JTA". A small intersessional working group was established to deal with this question, more especially from the historical standpoint for the time being, and to report at the next meeting.

G-1-2. Status of U.S. processing agreement (see exhibit # 24)

Eric Locklear began his presentation with an introduction of himself as the newly appointed U.S. Representative of Country (ROC), and stated his desire to work with the OPSCOM. He gave a presentation about the highlights, program status, and proposed actions for the US processing agreement. He highlighted the usage growth of the US users, and the anticipated costs to the users to remain at 6.4M Euros, which was agreed to at the JTA meeting in October, 2005. Regarding program status, he stated that while the pilot program was successful, soft-landings had to be provided to the animal trackers and a permanent solution is being worked

on. In his conclusion, Mr. Locklear summarized the on-going discussions between himself, NOAA, and CLS regarding the future role the US NOAA/OCO program will play in the JTA and the future of the JTA itself. He continuously stressed building on the past success of the JTA and the ARGOS Program during these deliberations. In his conclusion, Mr. Locklear proposed to complete the analysis of the NOAA/OCO participation in the JTA and completing the analysis of the future of the JTA prior to the October 2006 JTA meeting in California. Mr. Yves Tréglos remarked that the analysis of the future of the JTA is on-going, would likely lead to the establishment of a permanent review mechanism.

G-1-5. Financial status of Agent (see exhibit # 27)

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

For the third consecutive year, Christophe Vassal presented the meeting with CLS methodology to derive the Argos basic costs to be attributed to the JTA.
It showed that the Argos basic costs have slightly increase from 11.16 M€ to 11.76 M€ mainly because significant work has been performed in 2005 to adapt Argos ground segment to the next Argos generation to fly onboard MetOp A to be launched in July 2006.
The costs to be attributed to the JTA are calculated at 6.13 M€.

Christophe Vassal recorded that 2005 was a transition period. Up to 2004, JTA was under a 5 year plan, which ended up with an excess of 0.5 M€. At the October 25 – 27, 2004 meeting of the Argos Joint Tariff Agreement (JTA) in Chennai, India, agreement was reached on a structure for a new tariff to begin January 2005. The meeting recognized that a transition period was required so that the new tariff mechanism can be fully explained to the users and be ready to be implemented. The meeting thus created a pilot program. All JTA member countries participated except for UK, China and Canada.

In 2005, CLS recorded revenues from JTA countries at a level of 5.94 M€ slightly different from the revenues expected from the JTA at 6.8 M€. This shortage in revenue is explained by 3 factors:

- ✓ Lesser revenues from China, UK and Canada still under the old regime,
- ✓ Soft landings provided for user programs tracking marine mammals,
- ✓ Revenue above large program fixed price.

However the costs to be attributed to the JTA using the methodology developed by CLS science 3 years now shows basic costs to be attributed to the JTA at a level of 6.13 M€ in 2005.

So in 2005, JTA is going to contemplate a little loss of 0.19 M€ compensated by the 2004 excess of 0.5 M€.

The non JTA incomes also increased significantly in 2005 from 6.08 M€ to 7.04 M€ slightly exceeding their portion of the costs.

Consequently, the non JTA accumulated loss at the end of 2005 is calculated at 8.70 M€.

At the date of the meeting, all indications show that the JTA in 2006 may cover its portion of the costs with all countries being adopted the new tariff scheme and a significant program of accommodation through soft landings for several marine mammal programs.

The OPSCOM co-Chair thanked Christophe Vassal for the clear presentation of the Argos financial situation.

5 THE 2005-2009 YEAR OPERATING PLAN

The 5YP plan is provided in the annex " **Report from CLS/Argos on the New JTA Tariff".**

6 FINANCIAL STATEMENT

6.1 Annual Expenses (in kEuros) for Year 2005

		Personnel	Costs	Amortization	Total
Management		***588***	***364***		***952***
Operational costs					
	Quality	167	16	0	183
	Studies & development	645	162	228	1 035
	Processing center	1 573	182	276	2 031
	Client support/customer service	903	1 063	0	1 965
Sub-total Operational		***3 288***	***1 422***	***504***	***5 214***
Marketing costs					
	Promotion Communication	911	600	13	1 525
	Travels, hosting	0	423	0	423
Sub-Total Marketing		***911***	***1 024***	***13***	***1 949***
Administrative costs					
	Administration, finance, audit	1 102	454	14	1 570
	Costs for presence	127	734	102	963
Sub-Total Administrative		***1 229***	***1 188***	***116***	***2 533***
Taxes, bad debts provision & financial costs					
	Taxes		325		325
	Financial costs		496		496
	Provisons		294		294
Sub-Total		***0***	***1 116***	***0***	***1 116***
Total		**6 015**	**5 114**	**634**	**11 763**

Table 3.1: Detail on 2005 Expenses in k€

6.2 Details of Amortization Items

	Amortization	Description
Operational costs		
Quality	0	
Studies & development	228	*GTS, SSA3, Argos 2001*
Processing center	276	*Maintenance processing center (hardware and software)*
Sub-total	**504**	
Marketing costs		
Promotion	3	*Exhibit, International meetings, User Conference Costs*
Communication	10	*Exhibit, documentation Costs*
Sub-total	**13**	
Administrative costs		
Management control	14	*Accounting system, Argos registred mark*
Costs for presence	102	*Office furniture, safety, general equipment*
Sub-total	**116**	
Total	**634**	

Table 3.2: Detail of Amortization Items in k€

6.3 Annual Incomes (in millions of Euros)

Incomes (M€)	**2004**	**2005**
JTA	6.29	5.94
Non JTA	6.08	7.04
Total	12.37	12.98

Table 3.3: JTA and non JTA 2004, 2005 Incomes

6.4 Details of JTA and non JTA Incomes and Expenses (in million Euros)

	2004	2005	
Incomes			
JTA CLS	2.21	2.00	
JTA SAI	4.08	3.94	
	6.29	**5.94**	**-5.54%**
Non JTA CLS	5.58	6.51	
Non JTA SAI	0.51	0.54	
	6.08	**7.04**	**+15.8%**
Total basic Argos incomes	**12.37**	**12.98**	**+4.94%**
Expenses			
Total basic Argos expenses	**11.17**	**11.76**	**+5.35%**

Table 3.4: Detail of JTA and non JTA Incomes and Expenses

6.5 JTA Annual Balance (in millions of Euros)

	2004	2005
JTA Operating Costs*	5.40	6.13
JTA Income	6.29	5.94
Difference	0.89	-0.19
Accumulated Difference	0.49	0.30

* The remaining difference from 2003 was -0.4 M€.

Table 3.5: Annual Balance

For year 2005, the costs to be attributed to the JTA, calculated using the methodology developed by CLS science 3 years now, is 6.13 M€ - see document in annex 2.

7 OTHER ISSUES RELATING TO ARGOS FUNDING

7.1 Management of ID numbers

Unused ID Numbers and 28 bit IDs

JTA XXIII meeting (2003)

(i) *"..The phasing out of the unused ID charges:* The meeting agreed not to take any action on this issue until the end of the FYP, and to consider it again at JTA-XXIV"

In August 2006 there were 27 472 ID numbers allocated to JTA applications out of which some 69% (against 62% last year) – 18 961 IDs - were 28 bit. Though the situation is improving, there's still a fair amount of 20 bit IDs in JTA programs (8 512 IDs) thus we strongly encourage the unused ID charge to continue.

7.2 Free Access to Third Satellite

All countries have been enjoying the multi-satellite service in 2006.

7.3 Incentive for frequency spreading

CLS/SAI continued promotional activities to educate users and ask manufacturers to
Utilize voluntarily all available bandwidth. CLS/SAI proposed to enhance the situation through a better coordination between CLS/SAI, Users and manufacturers. The new ArgosWeb site has been implemented in September 2006. Web pages dedicated to manufacturers are under design. All along the year, CLS/SAI have been undertaking, on user or manufacturer requests, dedicated studies and provided advice on best frequencies (and transmit power) to be used.

7.4 Factoring additional charges

This was accommodated by the new tariff structure and applied to all countries.

7.5 ArgosDirect (ADS) appropriate strategy for users in Polar regions

Three actions were taken:
- A discount up to 50% has been applied upon data volume to all ArgosDirect disseminations.
- A dedicated rebate was granted to the affected programs (IABP)
- In addition, ArgosDirect strategy for this program has been optimized. CLS developed the dedicated processing and format to disseminate IABP Ice Mass Buoys (IMB) onto the GTS, so realtime ArgosDirect is no longer needed and related costs are cut down. In addition, the user is happy to have his data inserted onto GTS with no more work on his side.

7.6 Downlink tariff and high data rate channel policy

METOP 1 will carry an Argos-3 instrument equipped with a downlink capability and the 4.8 kbits high data rate channel.
It is suggested to continue with the proposed Downlink Tariff Policy presented at JTA XXII, that is a fixed monthly fee of possibly 20 € per active PTT. As per the high-data rate channel, it's

proposed to add a category “high data rate” with a specific day unit rate, for example 1/3 more than the “Large Volume – Float” category, 12 €.
In line with our discussions at JTA XXII meeting, to foster the test and use of these new capabilities, CLS/SAI proposes to grant free access to these new services for a one year period.

7.7 Processing Iridium data

CLS America is currently processing for GTS dissemination the Iridium data from ARGO floats deployed by the University of Washington. In parallel, CLS is studying the feasibility of the integration of Iridium data set directly in the Argos data base. This would enable the user to benefit from all the Argos service capability such as platform calibrations curves, online data dissemination and data sharing, databank, GTS processing etc…We are at the initial steps of the study which shows, that provided some development work, data with well identified formats and moderated volumes (SDB) could be easily integrated.

8 DEVELOPMENT PROJECTS OF THE ARGOS SYSTEM

These projects are presented in three categories:

8.1 Latest Projects Completed:

Argos 2001 project (Argos processing chain renewal) step1
On-line access to Argos technical files
BUFR code development
Argos 2001 project (Argos processing chain renewal) step 2
ADEOS II/Argos processing sub-system upgrade
GTS distribution of sub-surface floats

8.2 Projects Being Developed (or which started in 2006)

Argos 2001 project (Argos processing system renewal) step 3
GTS Subsystem adjustements and developments (open action item)
Improved delivery times (open action item)
Argos data web: first phase completed, service open in September 06 to all users.
Argos – Downlink Messaging Monitoring Center upgrade and related web interface
Implementation of METOP compatible network of LUT antennas

8.3 Projects under study

ArgosWeb evolutions
Argos 4 instrument
Processing Iridium data

_____

ANNEX VII

REPORT FROM CLS/ARGOS ON THE NEW JTA TARIFF

1 IMPLEMENTING THE NEW TARIFF IN UK, CANADA AND CHINA

New tariff has been implemented without difficulties in UK, Canada and China. Programs affected by the new structure were reviewed one by one and soft landing tariffs were provided, mainly for marine animal applications, in agreement with ROCs.

The total revenue shortage related to soft landing for 2006 for all countries is estimated to be 370 k€.

2 LARGE PROGRAM (OCO)

As agreed at the JTA XXV meeting, CLS monitored the barometer upgrades within OCO programs. For 2006, based on the answers we received, the number of upgrades financed by non OCO organizations amounts to 79 SVP-B, and a similar or higher number is expected for next year.

NOAA/OCO continued to participate in the JTA under the "large program" category with a projected consumption in 2006 on the order of 1,400 ptt-yrs. Discussions are underway with OCO which are aimed at proposing to the JTA a further reduction beginning in 2007 of the B coefficient for "large programs" consuming more than 1200 ptt-yrs (2 €). Due to its large impact on the JTA revenue, agreement on this issue will condition CLS proposals on JTA pricing accommodation, as discussed in next sections.

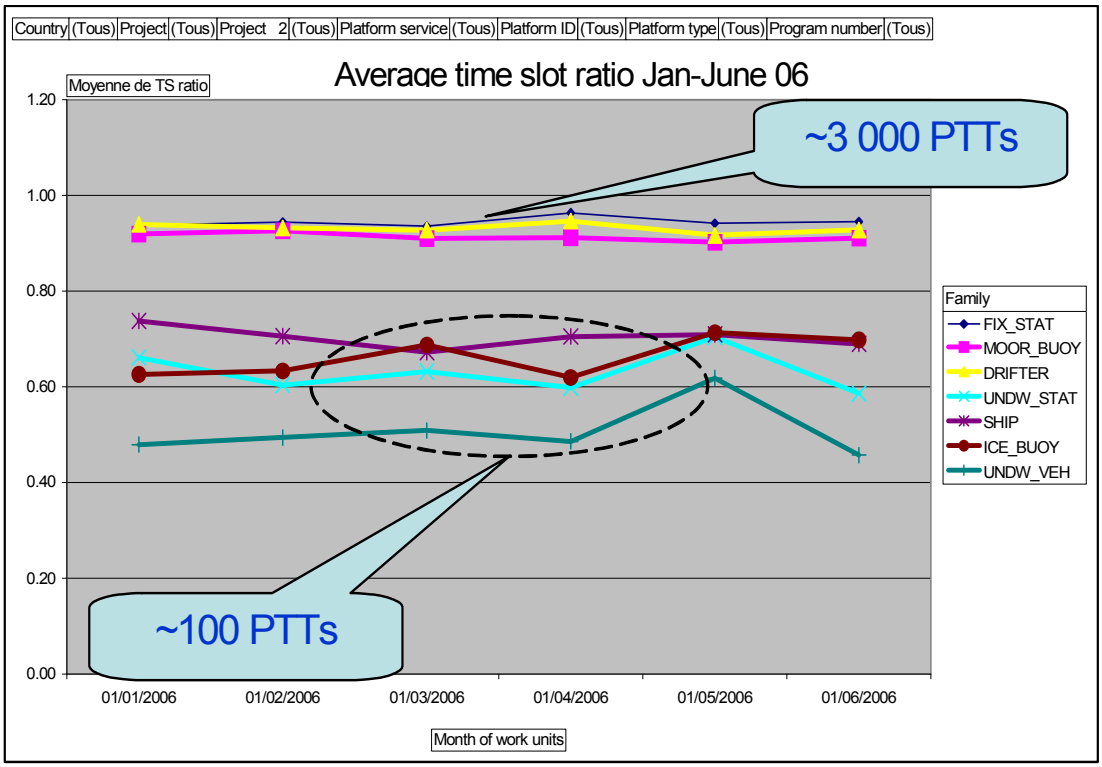
3 APPLYING TIME SLOT TO ALL PTTS

From JTA XXV report:
"The Meeting reaffirmed that the agreement by the Meeting at JTA-XXIV regarding the implementation of the time-slot approach in the new tariff scheme was, in principle, relevant to all categories…"
"At the same time, the Meeting noted the potential financial implications of applying the time-slots to drifters and hence bringing an additional risk to what was an already potentially strong decrease in revenue. Therefore it agreed that the universal application of time-slots should be not applied before 1 January 2007, so that 2006 results can be used to assess whether an adjustment in the B coefficient would be necessary to insure that the JTA revenue ."

The purpose of this study is to estimate the revenue loss when time slot accounting is applied to all JTA platforms in view of an adjustment of the B coefficient, if appropriate.

The diagram below displays the mean time slot ratio – i.e. number of day units with time slot accounting divided by number of days without time slot accounting - from January to June 2006 for category Buoys and others.

It shows that for the main categories, drifters and moored buoys, the ratio is quite stable and close to 0.9, which means that applying time slot accounting to all PTTs would actually reduce the overall JTA revenue.



The quantitative analysis is done on the JTA consumption from January to June 2006, and revenue loss in € is extrapolated on 2006.

	Buoys & Others	Buoys & Others - large pgm	Fixed stations	Total	Extrapolated Total 2006
B rate	6	3	3		
Average # Platform ID	970	1 776	170	2 915	2 915
Days units w/o Time slots	111 353	281 478	27 430	420 261	840 522
Day units with Time slots	105 721	278 104	26 673	410 498	820 996
Time slot Ratio	0.95	0.99	0.97		
Day units loss	-5 632	-3 374	-758	-9 763	-19 527
Revenue shortage	**-33 791**	**-10 122**	**-2 273**	**-46 185**	**-92 370**

It shows a resulting revenue shortage of ~100 k€. With consideration of the 5Y Plan expected balance, and should agreement with OCO be set as expected, CLS proposes to apply time slots to all PTTs without modification of the B coefficient.

4 TUNING THE TARIFF SCHEME, EVALUATING OTHER CHARGING ALGORITHM

4.1 Preamble

1) The new tariff is the result of a coordinated process between JTA participants and, overall, it gives satisfaction to most users. As noted by the meeting at the JTA XXV "… many countries that joined in the Pilot programme generally expressed their satisfaction on the new tariff scheme, particularly on its efficiency and global consistency."

2) Still, due to the wide variety of Argos applications and prices paid by users within the former tariff scheme, even within same categories of PTTs, the new scheme could not be a perfect solution. As a result some users were affected by the change. This was the case in particular

for some users tracking marine animals. CLS worked with the affected programs to minimize the financial impact and accommodated, on case by case base, “soft landing” rates

3) The JTA XXV meeting also noted “Although the meeting agreed that new algorithm might potentially be a fairer way of charging system use, it felt introducing a new system at this stage would be confusing, and might only be beneficial to a small number of programs”.

The purpose of this section is hence to propose to the meeting ways to accommodate on a long term basis and within the new tariff scheme, the tariff for those affected applications.

We start recalling the construction process and the rationale which lead us to the new tariff scheme. Some comments are then given on the charging algorithm proposed at the JTA XXV. We then examine the situation of the marine animals and propose solutions.

4.2 Recall of the new tariff scheme & supporting tariff rationale

The paragraphs below present a synthesis of the construction process of the new JTA tariff.

Before JTA XXIV meeting:

1. A working group was set-up at JTA XXIV
   - ☞ David Meldrum, Steve Auer, Ken Jarrot, Derek Painting, CLS

2. During the year, a pricing structure was suggested by CLS
   - ☞ One unique service, “all included”
   - ☞ PTT cost per month: A + B * # day units

3. Simulations were done to:
   - ☞ Minimize impacts on countries & programs
   - ☞ Minimize JTA revenue loss

4. A meeting was conveyed with the working group in June 04
   - ☞ There was an overall agreement on procedure with some concerns expressed on the transition especially for LUS and countries enjoying full bonus.

5. CLS proposal for discussion at JTA XXIV
   - ☞ A = 15 €, B = 6 €, “soft landing” TBD for tuning affected programs

During JTA XXIV meeting

Following three slides were presented and discussed at the JTA XXIV. They are the basis of the agreement on the new JTA tariff.

What may affect the costs:

(1) Transmission Characteristics (Tx duration, Tx period, data volume):
- ☞ impacts satellite occupancy,
- ☞ processing hardware & software at GPCs

(1) Manpower Workload at Argos
- ☞ Impacts Argos personnel costs

Calculating the cost

- PTT cost per month: A + B * # day units
- Day units: 4 time slots
- (0 – 6; 6-12; 12 – 18; 18 – 24)
- PTT Transmission collected in a given time slot, produces 0.25 day unit
- Transmission one full day ⇒ 1 day unit

☞ Advantage for Animals, floats

Calculating the cost

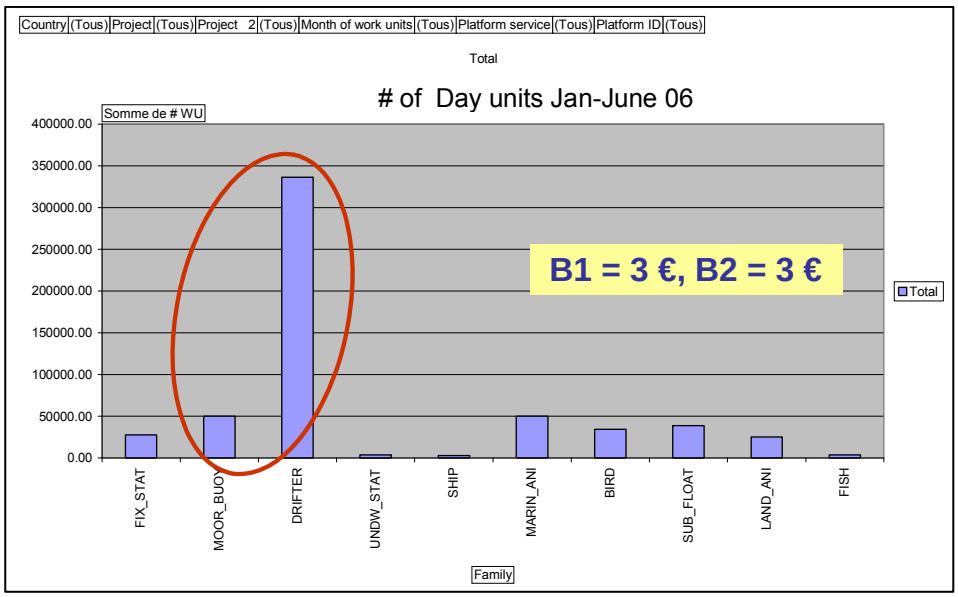
-
- PTT cost per month: A + B * # day units
- B = B1 (Volume) + B2 (Workload)
- Standard B (full time drifter): B = 3 + 3 = 6 €
- Large volumes (ARGO floats): B1 = 2 x 3 = 6 B2=3
- Few Tx per months (Animals): B2 = 2 x 3 = 6 B1=3

☞ Floats, Animals: B = 9 €

- Transmission one full day ⇒ 1 day unit

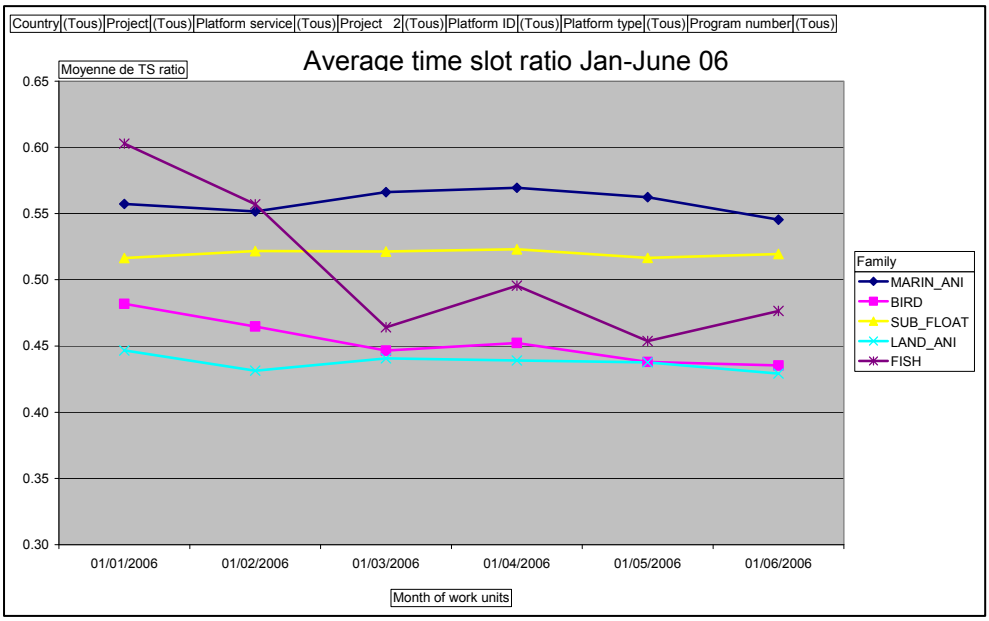
Supporting the rationale developed during the JTA meeting

1. Drifters& moored buoys were adopted as "standard" PTTs for the purpose of establishing the standard B rate (B = 6 €)



☞ The diagram above displays the day units per PTT type. Drifters & moored buoys actually provide most of the JTA revenue, and are thus best candidate for standard or reference PTTs.

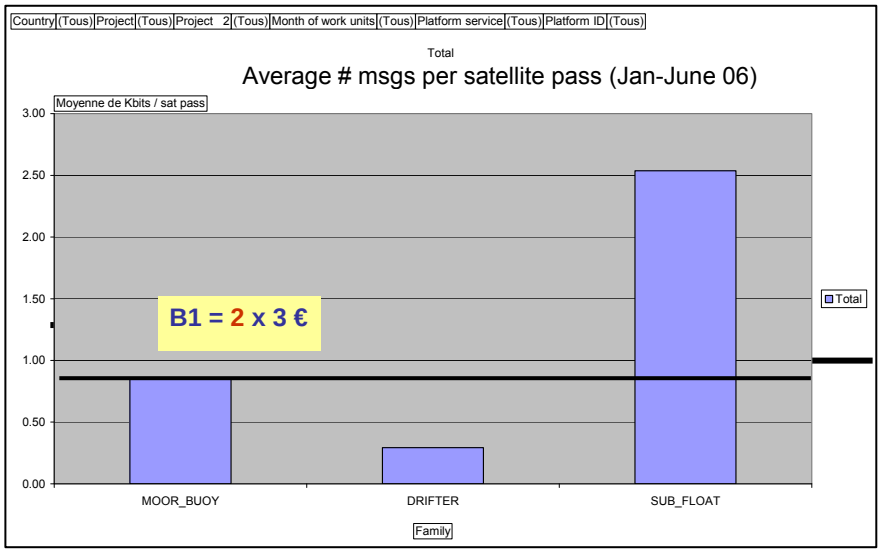
2. Time slot accounting was introduced to take into account PTTs transmitting part time (ex. LUS): the expectation was that this would reduce by at least 50% the day units for animals.



☞ The diagram shows the average time slot ratio – i.e. number of day units with time slot accounting divided by number of days without time slot accounting - from January to June 2006.

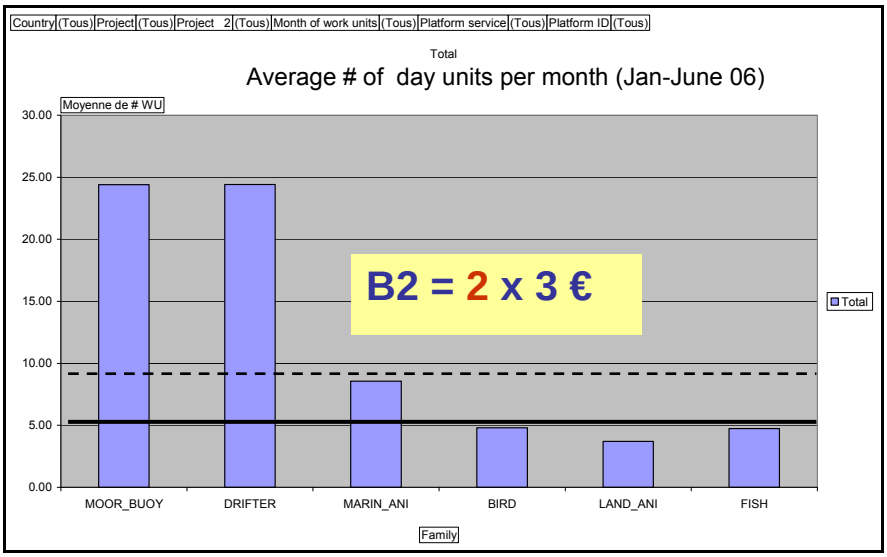
☞ It can be seen the expected target is exceeded, except for marine animals. Floats which were not benefiting from the former LUS service are also benefiting from this new accounting.

3. Comparison floats versus standard PTTs



☞ Floats transmit more than twice as many messages as the moored buoys and the drifters.

4. Comparison Animals versus standard PTTs



- ☞ It can be seen that most animals produce less than 5 day units per month, to be compared to the 24 days of the drifters, for same manpower workload per month.
- ☞ The marine animal category produces more day units per month than the other animals. Still, the average number is below ten days.

4.3 New charging algorythm

'CLS/Service Argos should evaluate other charging algorithms that might offer a better long-term solution for the apportioning of costs according to system use, and report back to the next session'

Mr David Meldrum was invited to Toulouse in July 2006 to work with CLS in evaluating other possible charging algorithms, including an algorithm proposed by Mr Meldrum at JTA-XXV which would set the B coefficient according to system occupancy.

A prime goal of the work was to investigate to what extent the existing tariff structure could be tuned to accommodate all classes of platform on an equitable basis. To this end, CLS created for Mr Meldrum a detailed set of usage statistics for the entire population of JTA platforms for January – June 2006.

CLS understands that Mr Meldrum plans to present the detailed results of his studies in a separate paper.

4.4 Accommodating the tariff for marine animals

When considering the marine animal category, we see that several programs can actually be affected by the new tariff structure.

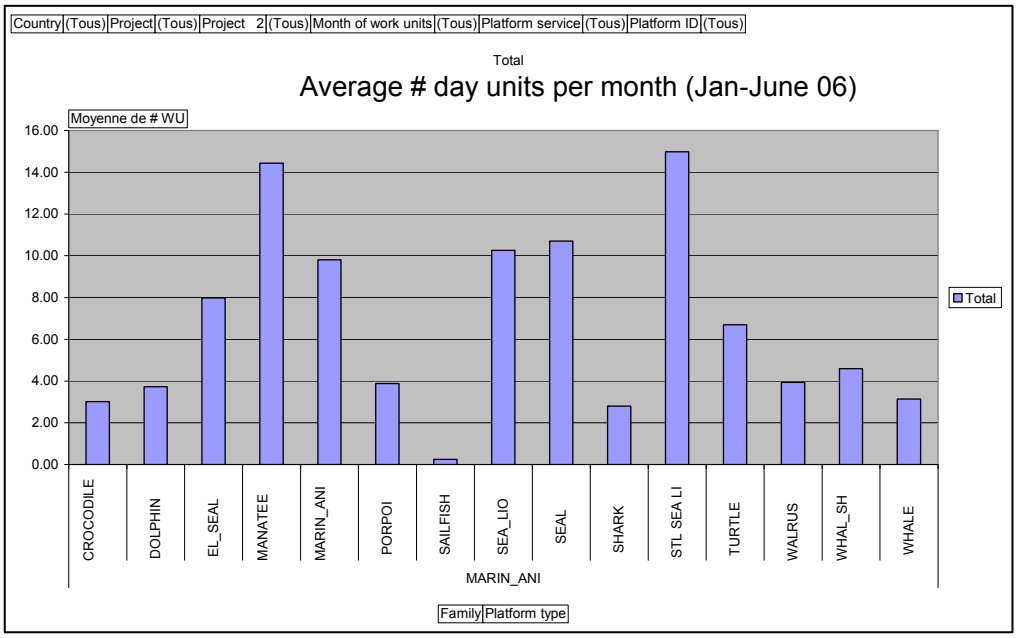
This results from the combination of several factors:

1. Factors related to the uniqueness of the marine animal applications
- The number of days of transmissions per month can be high
- Transmitter performance is such that most time slots are matched each day.

2. Factors related to former JTA structure and implementation
- Marine animals benefited from Limited Used Service since 1997 though they were not using programmed duty cycles

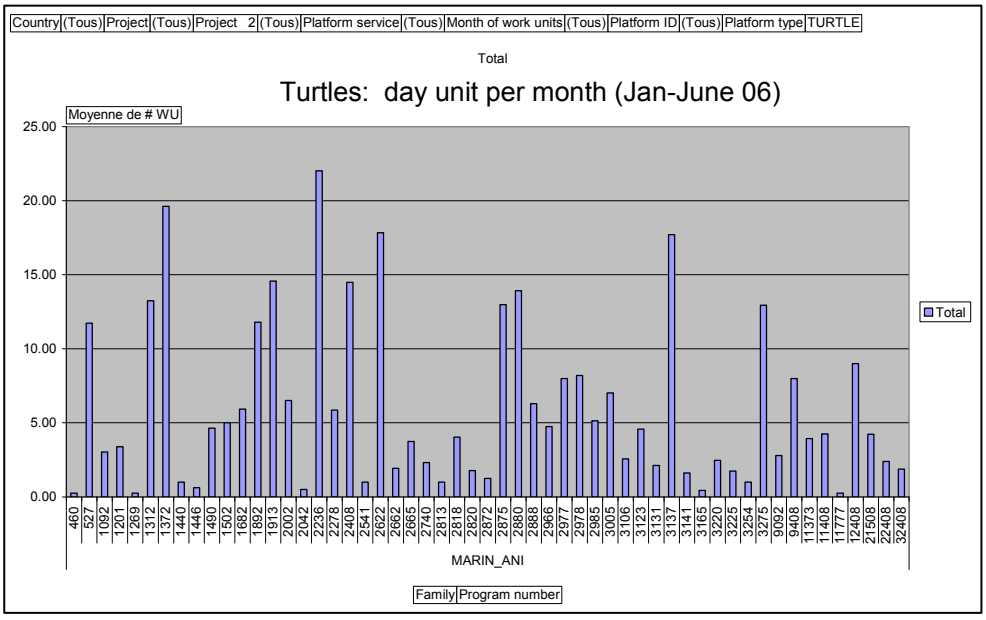
- ROC policy: some ROCs did not apply the Active monthly fee to their users when it was implemented in year 2000. This fee tended to reduce the price gap between standard platforms (drifters, moored buoys) and animals.
- Countries enjoying full bonus

As for the design of the JTA new tariff structure, the approach is, as a first step, to try to identify a common pattern, a standard platform behaviour. The diagrams below show large variations between applications in term of number of day unit per month and also time slot ratio1.



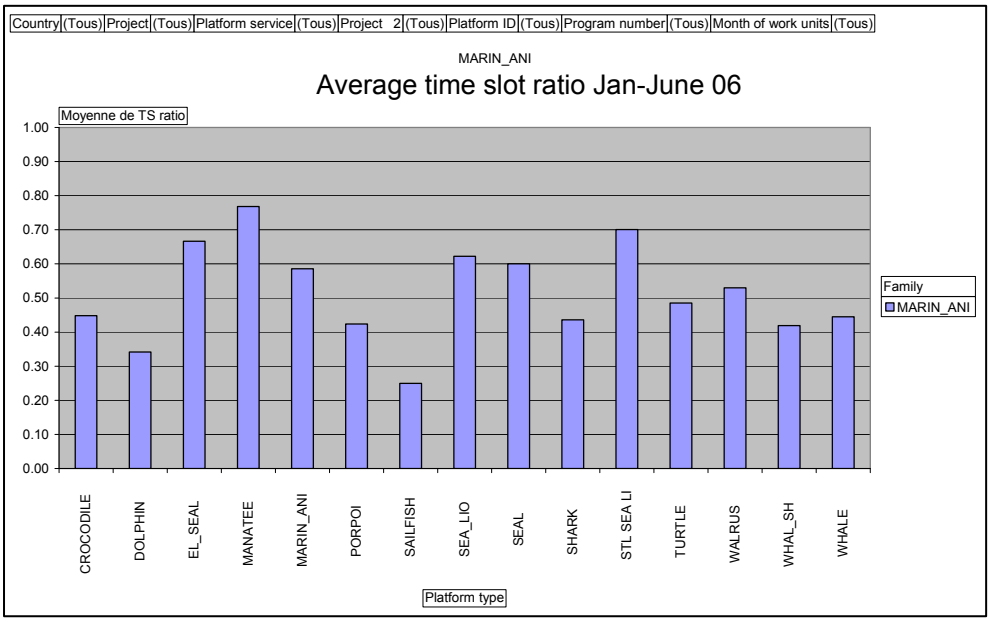
The diagram shows the average day unit per month by marine animal category:

☞ It can be noticed that variations among categories are important



A “zoom” on turtle programs, also shows significant variations in system use. Results on seals are similar. The largest number of marine animals are in the system are in the turtle and seal categories.

1 This may be explained by variations in performance related to animal behaviours and also tag performance.



The diagram above shows the average time slot ratio between marine animal categories. It shows that the ratio varies a lot and can be, on average, as high as 0.8 and as low as 0.25.

As a consequence, it is difficult to define a standard for marine animals and hence to design a clear rule.

But, because:
1) The behaviour of these animals in the sea prevents the user from programming transmission within time slot frames, and hence fully benefit from this accounting
2) AND the number of days of transmissions per month can be high.

Then, we propose to set the “B” coefficient to 6 € for all marine animals, instead of 9 €.
This would be implemented progressively in a three year time frame from 2007 to 2009 as follows:

- B coefficient will be reduced by one Euro each year for all marine animals not benefiting from soft landing, reaching 6 € in 2009.
- B coefficient will be increased by one Euro per year for programs benefiting from soft landing until they reach the 6 € rate, in 2009 latest.

The time slot accounting, ~0.6 on average, will further reduce the daily charge to 3.60 €.

As for the “Time slot for all” change, this is dependent on the result of the agreement on Large program (OCO).

5 FINANCIAL SITUATION

5.1 Recall of the 5Y Plan

Extrapolation Jan-July 06

In euro	2005 Actual	2006 Extrapolated	2007	2008	2009
JTA Costs (M€)					
cost increase %	2.0%	2.0%	2.0%	2.0%	2.0%
Actual & Forecast	6.13	6.47	6.60	6.73	6.87
Agreed 5YP JTA Cost	***6.00***	***6.40***	***6.40***	***6.40***	***6.40***
JTA Income					
Activity: Actual and *Forecast*					
Growth Active PTTs (%)	*21%*	*14%*	*2%*	*2%*	*2%*
Growth PTT-yrs (%)	*20%*	*12%*	*2%*	*2%*	*2%*
Active Ptfs (Total)	*7720*	*8772*	*8948*	*9127*	*9309*
PTT-yrs (Total)	*2852*	*3191*	*3255*	*3320*	*3386*
Active PTTs (w/o large program)	*5244*	*5794*	5909	6028	6148
PTT-yrs (Buoys & Others)	*682*	*653*	*666*	*679*	*693*
PTT-yrs (floats w/o large pgm)	*105*	*121*	*124*	*126*	*129*
PTT-yrs (Animal)	*580*	*628*	*640*	*653*	*666*
PTT-yrs (Fixed stations)	*156*	*151*	*154*	*157*	*160*
Active PTTs (large pgm)	*2476*	*2979*	*3038*	*3099*	*3161*
PTT-yrs (large pgm) Buoys & Others	*1258*	*1546*	*1400*	*1520*	*1596*
PTT-yrs (large pgm) Floats	*71*	*93*	*95*	*97*	*98*
Basic Service Income					
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	1.04	1.06	1.08	1.11
Day unit income (M€)	3.91	4.05	4.14	4.22	4.30
Total Large pgm (M€)	1.94	1.77	1.67	1.77	1.84
Total basic service expected (M€)	**6.80**	**6.86**	**6.87**	**7.08**	**7.25**
Additional revenue	**0.20**	**0.15**	**0.15**	**0.1**	**0.05**
Revenue shortage					
Former JTA - CA, CN, UK	0.21	0			
Soft Landings	0.26	0.37	0.30	0.2	0.1
Revenue above Large Program Fixed price	0.59	0.42	0		
Total Actual basic service (M€)	**5.94**	**6.23**	**6.72**	**6.98**	**7.20**
Year Balance	-0.19	-0.24	0.12	0.24	0.33
Carried forward from previous year	0.50	0.31	0.06	0.18	0.43
Cumulated Balance	0.31	0.06	0.18	0.43	0.76

If JTA were to approve a daily rate of 2 € per day for large programs consuming more than 1200 PTT-yrs, and if OCO were to agree to pay for their actual consumption at the 2 € rate.

5.2 Actual situation for 2006 versus 2005 and 2004

	2004	**2005**	**2006***
JTA active PTTs	6 384	7 720	8 772
JTA PTTs.year	2 364	2 852	3 191
Revenue JTA CLS (M€)	2,21	2.0	2.39
Revenue JTA CLS America (M€)	4,08	3.94	3.84
Total revenue (M€)	**6.29**	**5.94**	**6.23**

* Predictions based on 7 months of actual usage.

As forecast when we decided on the new tariff scheme, and based on growth expectations, the JTA is back on track in 2006 with an expected income close to the 2004 revenue.

5.3 Proposal for 2007

Provided that the expected agreement is settled on large program (OCO), CLS proposals are:

1. Apply time slot accounting to all categories with no increase of B coefficient
2. Reduce "B" coefficient for marine animals from 9 € to 6 € over a three year period, 2007- 2009.
3. Suppress progressively soft landing accommodations over the same period.

6 APPENDIX:NEW JTA TARIFF: BENEFIT FOR USERS (RECALL)

The new tariff structure proposed is SIMPLE, COMPREHENSIVE and FLEXIBLE, COST-EFFICIENT and GLOBALLY CONSISTENT. In addition, a fair amount of time has been spent so that the transition be as seamless as possible. This constraint has driven in most cases a cost reduction for all.

a. Simple

JTA rules and management are simplified; they can be easily explained and understood by all.

- Simple accounting: a monthly charge per Active PTT and a PTT.day rate
- Simple invoicing upon consumption
- Just one Service category: location and data collection, all processing facilities included
- ROC task is simplified: direct invoice from CLS to users, easier budget planning, simple rules…

b. Comprehensive and flexible

One service category means all-in one service for all applications, users select most appropriate service only upon technical criteria (no financial implication):

- Doppler location, GPS or both, user decides according to his needs and technical constraints,
- All processing, online access and databank capabilities available for all applications – i.e. email, Ftp, telnet, GTS, data web access. User can decide whether he retrieves the data from his LUT, from Argos centers or both.
- Multisatellite service, Location service Plus / ALP (access to diagnostic tools), dual processing, are included in the basic service.

c. Cost-efficient

Significant cost reductions for most users, especially for applications transmitting frequently such as drifters, moored buoys…:

- “Pay what you use”: invoices are based on actual use,
- No more surcharge for more than 6 locations/ more than 10 data collections
- No more administrative fees (still, charges may be applied when the administrative work load is high and the consumption low)
- No more 70% advanced payment
- Additional services such databank, Automatic Distribution Service (ADS), processing modifications…are kept outside the basic service, and charged only when required, as per today.

d. Globally Consistent

- Consistent with JTA guidelines. JTA pays for JTA related costs only as determined by new accounting procedures
- All countries pay same price, no more variations due to variable bonus
- Incentive for new users: easy rules, transparent system.

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ANNEX VIII

COMPARISON OF A POSSIBLE NEW CHARGING ALGORITHM WITH THE EXISTING TARIFF

1. Background

Most communications companies (e.g. phone companies) base their charging algorithm on two components, a 'membership' charge **A** (e.g. monthly fixed charge, line rental), plus a 'consumption' charge **B** (e.g. call volume, connect time, data volume). The consumption charge **B** is quantised so that a minimum call charge is always payable (typically quanta are 1 minute, or 1 kbyte).

Until a few years ago, Argos based its charging algorithm on the PTT-day, whereby any activity by a platform during a UTC day triggered payment of a day unit charge. Essentially there was no membership charge (**A** = 0), and the **B** quantum was 1 day.

More recently, a membership charge **A** was introduced in the form of an 'active platform' fee, whereby any activity by a platform during a calendar month triggered the payment of **A**. This was to help pay for the additional workload associated with programmes whose consumption was low, but whose platform count was high. These programmes typically belonged to animal trackers.

At more or less the same time, it was realised that many platforms did not transmit continuously, and so were making a limited use of the communications opportunities afforded to them. Nonetheless these platforms paid the full day rate **B**. This was recognised as being unfair, and a 'Limited Use Service' (LUS) charging category was introduced whereby such platforms effectively paid a day rate of **B/3**. Platforms eligible for this category included units for which the duty cycle was less than 1/3, and sea mammals, which typically spent most of their time submerged.

Additionally, the tariff algorithm contained many other components, such as different **B** rates for other classes of platform and use, additional charges for supplementary locations, access to the full satellite constellation, bonus allocations, etc. Eventually it became almost incomprehensible except to the few who regularly attended the JTA sessions.

The need for change was recognised, and a possible framework sketched out at the 2003 JTA session in Brazil. The key features were to simplify the system, to make it equitable, and to operate like a phone company, with billing in arrears based on actual consumption.

2. The pilot scheme (2005)

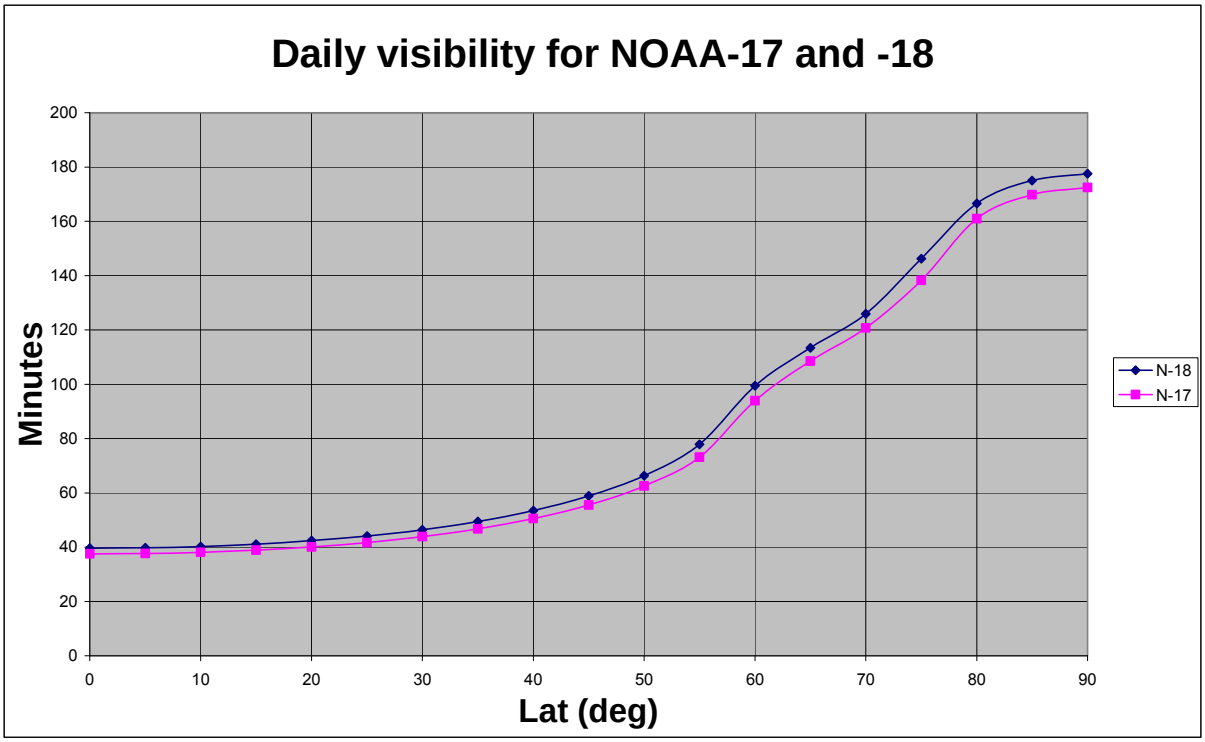
The first outcome of the tariff review has been the 'pilot scheme', which is well described in the body of this report. Essentially the full functionality of the Argos system is made available to all platforms for an **A** rate of 15 euro per month, plus a daily **B** rate. The **B** rate depends on the class of platform, and the charging quantum is reduced to 6 hours in some cases. Invoicing is in arrears. Overall this is a significant step forward, and has been widely welcomed in most quarters.

Nonetheless, whereas the **A** rate is recognised as being an appropriate 'membership' charge, difficulties remain in matching the **B** rate to 'consumption' in an equitable way. Attempts to redress this inequality have already caused the complexity of the algorithm to grow in an unwelcome way. The fundamental problem is that the time quantum (6 hours minimum at present) cannot be reduced indefinitely to improve the accuracy of the consumption charge because of the multi-hour gaps that naturally exist between satellite passes at low latitudes. Even a quantum as large as 1 hour would show a strong latitudinal dependence in platform operating costs, given the concentration of satellite passes over the poles.

3. An alternative approach

The problem lies with the consumption charge, the **B** rate. Ideally the **B** rate should be a charge per kilobyte of data passed through the system by the platform, but these data are apparently not readily available in the current Argos database (though they could be). A close proxy to data volume could be the number of messages ('hits') passed by the platform, or indeed the number of time quanta ('time-slots') occupied by the platform, if the quantum was a 'mini-slot', say, of 1 minute. As noted above, however, a strong latitudinal dependence in costs would result.

4. Correcting for the latitude dependence



The above chart shows the total daily visibility for two Argos satellites as a function of latitude. The visibility is a function of the orbital parameters, which are well known, and change little during the life of the satellite. It is therefore relatively straightforward to scale the number of mini-slots or messages to correct for latitude, and thus prevent overcharging of high latitude platforms.

5. Correcting for constellation size

The number of mini-slots or messages ('system occupancy') logged by a platform on a give day also depends on the number of active satellites in the constellation. This can change in response to new launches, operational problems, ground station availability, network outages and so on. Fortunately there are a number of Argos–operated reference stations in the system, the orbitography beacons, which could easily be used to give a figure for the effective size of the constellation on a given day.

It might also be thought that the apparent system occupancy might depend on the number of LUTs reporting data, but thankfully the Argos processing system effectively removes all duplicate messages and this will not confuse the picture.

6. The standard platform

One can envisage the concept of a standard platform as a platform situated on the equator, transmitting every 90 seconds. Such a platform would pay the standard **A** and **B** rates. The number $\mathbf{N_0}$ of mini-slots or messages that would be logged by such a platform is computed daily using the orbitography beacons (to give effective constellation size), and the latitudinal dependence curve.

A real platform, which logged **M** mini-slots or messages during the same day, would have the value of **M** scaled according to its latitude to give the occupancy $\mathbf{M_0}$ that it would have logged had it been on the equator alongside the standard platform. The platform would then be charged the standard **A** rate and an adjusted **B** rate:

$$B' = B\frac{M_0}{N_0}$$

Given that the majority of platforms transmit every 90 seconds, just like the standard platform, it is likely that a **B** rate slightly above the pilot value of 6 euro per day will generate approximately the same level of revenue as the pilot programme, with high occupancy platforms paying more (**B' > B**), and low occupancy platforms paying less (**B' < B**).

7. How to compute B

The correct choice of **A** and **B** is obviously crucial to the financial viability of this approach. If we choose to keep **A** at its present value of 15 euro per month, then the total **B** revenue should be the same as for the pilot programme. In other words,

$$\sum B' = \sum B_{pilot}$$

which can be expressed as

$$B = N_0 \frac{\sum B_{pilot}}{\sum M_0}$$

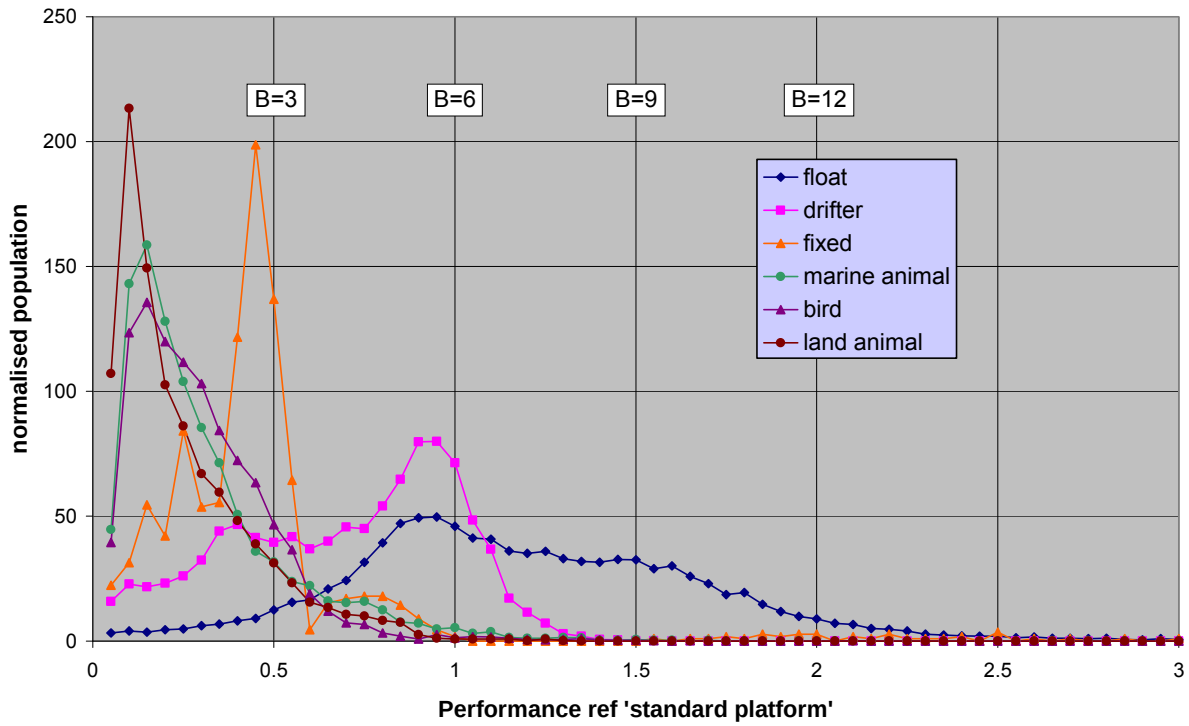
This equation can be solved using existing data for a random selection of platforms, or indeed the entire JTA population. Furthermore, the exercise could be repeated using different values of **A**, to allow the selection of global **A** and **B** coefficients that deliver the fairest possible result, with the least disruption to existing programme budgets.

8. Results of studies at CLS, July 2006

The prime goal of the work was to apply elements of the algorithm described above to real data and to investigate to what extent the existing tariff structure could be tuned to accommodate all classes of platform on an equitable basis. To this end, CLS had created a detailed set of usage statistics for the entire population of JTA platforms for January – June 2006. These were analysed in terms of the number of messages received from each platform compared to the number theoretically possible for a perfect 'standard' platform at the same location at the same time. A 'standard' platform was defined as transmitting every 90 seconds throughout the day. The resulting performance statistics are shown below, with the population in each category of platform normalized to 1000.

The computed performance is effectively a measure of the extent that a given platform made use of the system resources available to it in during every timeslot for which it was charged. As expected, drifters peak close to 1, i.e. their performance is close to that of the standard platform. Similarly, fixed platforms peak at 0.5 as expected, reflecting their lower repetition rate. Floats exhibit a wide range of performance values, possibly in line with the rather wide variation in repetition rates declared for these platforms, and have a mean performance rather than higher than drifters, close to 1.5. For these three classes of platform, the existing tariff B-rates (6, 3 and 9 euro respectively) are in fact a good reflection of the actual average usage.

The graph also shows that all classes of animal platform, not just marine mammals, perform very poorly compared to the standard platform. Indeed their average performance is less than 0.15. By any standard, the B-rate paid by these platforms (9 euro, the same as floats with a mean performance close to 1.5) is grossly disproportionate to the level of system use that they enjoy. This disparity had been recognised by CLS, and they had worked with the most severely affected programmes to offer ‘soft landings’.



Nonetheless, it was recognised that soft landings were not an equitable basis for developing a long-term, robust tariff structure that fairly apportioned costs according to system use. Accordingly it was seen as vital, within the context of the JTA principles of fairness, openness and the promotion of science, that the tariff be reviewed for animal tracking platforms.

David Meldrum
October 2006

ANNEX IX

Animal Tracking Issues

Proposal by Don Bowen (Canada), Pierre Richard (Canada), Mike Fedak(UK), David Douglas (USA)

Background

Marine animals (pinnipeds, cetaceans, turtles) forage at depth and therefore are infrequently at the surface and only for short durations in a rather unpredictable pattern. This behavioural duty-cycling severely limits the number of transmissions per day that result in estimated locations and thus represents a fundamental difference between marine animals and other PTTs tracked by Argos satellites. Because marine animals are rarely at the surface, we need to take every opportunity to locate them and send data. This means marine animals transmit in almost all 6-hr bins but use very little bandwidth. Compared to the old LUS tariff, the new tariff structure of quarterly daily time slots has resulted in a substantial increase (~2-3 times) in the cost incurred by those scientists tracking marine animals. Increased costs threaten to severely limit the kinds of research questions on marine animals that can be approached using Argos satellites. For example, foraging studies of marine animals rely heavily on the identification of "areas of restricted search" to infer foraging, estimate prey patch size and quality. Reducing number of locations per day to a 6-hr slot reduces data resolution making this kind of analysis difficult if not impossible. There is also increasing recognition of the importance of scale in understanding foraging decisions, particularly at fine scales (within day), again underscoring the importance of maximizing locations per day. Other examples of studies requiring high frequency sampling throughout the day would include tidal influences on behaviour, the effects of diurnal migration of prey on predator behaviour and seasonal changes in foraging behaviour.

Furthermore, we cannot understand how animals utilize their environment if we only track them for brief periods of each day. We need to take every opportunity to send behavioural and oceanographic data and get locations because opportunities to get them are few and far between, given the combination of low power of our PTTs, infrequent surfacing of animals and satellite availability. We need to know where to position dives and oceanographic profiles between locations. Importantly, our worst source of error is the result of the time between locations and we need to minimize this within our constraints of power, surface time, satellite availability and competition with more powerful transmitters.

Although negative effects of the new tariff structure were highlighted for certain marine animals, tracking studies on all animals could benefit from the flexibility to freely schedule how transmissions are distributed throughout the day and over time. Therefore, it was proposed that all animals be charged under the modified tariff proposed below.

Proposal

Whereas implementation of the 2005-2006 time-slot tariff imposed undue cost increases to a subset of the animal tracking community (namely the marine animal trackers, and specifically those whose PTTs transmitted within most time slots);

and whereas the present time-slot tariff possesses a greater potential to negatively impact scientific sampling designs by imposing high financial dependencies;

and whereas an ad-hoc and temporary "soft landing" was implemented to minimize financial burdens on a small number of heavily impacted projects;

and whereas new projects with analogous cost issues are not being offered "soft landing", creating conspicuously high and disproportionate tariff rates among animal tracking peers;

and whereas CLS desires to maintain the fundamental structure of the time-slot tariff approach;

the animal tracking representatives at JTA-XXVI propose that a form of limited use service (LUS) be reinstated across all animal tracking Programs. We believe LUS may offer a parsimonious solution that fully and immediately addresses all of the issues raised above. In the past, an LUS approach was adopted by the JTA to resolve animal tracking tariff issues, given the relatively low bandwidth used by their PTTs. Therefore, we suggest that the LUS approach is the most viable solution, both financially and scientifically, for the animal tracking community.

We ask CLS to conduct an empirical analysis of past animal tracking data (i.e., 2005 + 2006) to evaluate the viability of an LUS solution under the following initial guidelines:

1. Time-slot coefficients for all animal tracking programs are fixed at A=15 € and B=9 €;
2. A maximum of 40 time-slots are charged per PTT per month; and
3. A comparative cost analysis (using the same empirical data) is conducted to determine the retrospective reference-cost based on the old PTT-YEAR tariff with10-ptt-day per month LUS threshold.

CLS will provide the animal tracking working-group such a comparative (old PTT-year LUS versus new time-slot LUS) cost assessment. If CLS revenues under the new LUS tariff are different *in comparison* to the old LUS tariff, we propose the B-coefficient be adjusted to compensate for any shortfall or excess revenue generated by the new tariff. Increasing or decreasing the B coefficient equitably distributes any necessary compensatory cost adjustments across the entire animal tracking community. Alternatively, changing the 40-time-slot threshold is another mechanism to compensate revenues. The animal tracking community will concurrently conduct empirical analyses using their own Program-specific data sets, and share those results with CLS in an effort to cross-validate and agree upon a common analytical approach. We recognize that CLS holds the entire databank of all animal tracking programs, and is therefore best capable of making a single, pooled comparative analysis of the entire animal tracking Program-group. An objective of the proposed LUS animal-tracking tariff structure is to generate revenue from the animal tacking community comparable to that generated under the old LUS tariff.

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ANNEX X

TERMS AND CONDITIONS OF THE AGREEMENT FOR 2007

OBJECTIVE:

Further to the success of the JTA pilot program, to implement the new tariff structure for the whole JTA countries.

COUNTRIES TO PARTICIPATE:

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.

TIME PERIOD OF COVERAGE:

These Terms and Conditions are valid for the time period beginning on **January 1 and ending on December 31, 2007.**

DEFINITIONS

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

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

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

The "Agreement" includes all those participating countries which agree to the Terms and Conditions contained herein and which sign a similar Agreement with CLS prior to **March 1, 2007**.

The “Program Manager” is an individual responsible for any given, accepted programme.

BASIC SERVICES PROVIDED BY CLS

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

(1) Location determination or both location determination and data collection for PTT's with a repetition period equal to or less than 120 seconds, application of calibration curves to the data when appropriate, access to the data and distribution of the data according to the paragraph below entitled "Distribution of processed data" and archiving for three months;

(2) Data collection for (fixed station) PTT's with a repetition period equal to or greater than 200 seconds, application of calibration curves to the data when appropriate, access to the data and the distribution of the data according to the paragraph below entitled "Distribution of processed data" and archiving for three months;

(3) Multi-Satellite Service

(4) Location service plus / auxiliary location

(5) Dual Processing

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:

Price per month, per platform = **A** + **B** x **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 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. From 2007 the time slots will be applied to all platform categories.

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

Category	**A (€)**	**B (€)**
Buoys and others	15	6
Fixed Station	15	3
Animal	15	9
Subsurface Float	15	9

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

Fixed Stations – PTT's in this category are land fixed PTT's.

Animals – PTT's in this category are those that are used to track animals and transmit on either a designed in (by the manufacturer) duty cycle or on an effective duty cycle as with many marine animals.

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

DISCOUNT SCHEME FOR PROGRAMMES USING A LARGE NUMBER OF PLATFORMS

PTT-Years	**PTT–day unit (B)**
300	5
600	4
900	3
1200	2

UNUSED IDs

PTTs which have not transmitted during a period of 24 months will be charged 3.85 € per month from the 25th month until the ID numbers are returned to CLS.

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.

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

Added value services such as ArgosDirect (the former ADS) service, Databank, Moored Buoy monitoring and others are provided by CLS and charged upon the year catalogue of prices.

DESIGNATED ROC / RO / PROGRAMME MANAGER

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

DISTRIBUTION OF PROCESSED DATA

(1) These Terms and Conditions do not cover the costs of special off-line arrangements made to provide the processed data back to the users. These must be made by the user directly with CLS;
(2) However, it is understood that CLS will continue to provide data from PTT's via the World Weather Watch Global Telecommunication System (WWW/GTS) of the World Meteorological Organization (WMO) according to procedures established by WMO.

BILLING AND PAYMENT

CLS will send invoices on a two monthly basis based on consumption to the organizations listed in the count covered by the country agreement.

GENERAL CONDITIONS OF AGREEMENT

(1) The designated ROC / RO agrees to provide the initial list of users included in the Agreement and will update this list as appropriate.

(2) For services not provided within this Agreement, individual users under this Agreement must negotiate directly with CLS. Payments associated with these negotiations must be settled on receipt of the invoice. If these conditions are not met, CLS may stop the distribution of the user's processed data.

(3) Authorized users are defined as those implementing PTT's which are government funded. However, other users of agencies or organizations which are considered "non-profit" may be authorized. PTT's funded partly or entirely by private companies or organizations cannot be included in the conditions of this Agreement, even if data are supplied free of charge to national or international organizations.
If these rules are not followed, CLS may stop the distribution of this user's data. Should this situation occur, CLS will immediately notify the ROC / RO. Nevertheless, active PTT's received by the system will be counted in the platform-year total and data stored.

(4) All authorized users must sign a purchase order for each programme, either for the current year or for the duration of the programme, in order to clearly specify the services they request, whether these services are provided under this Agreement or not.

(5) VAT will be charged to EU Members in accordance with EU rules.

NORMAL TARIFFS CHARGED BY CLS

As an indication of additional costs for services not covered by this Agreement, the normal tariffs charged will be provided by CLS to the ROC / RO.

_____	_____	_____	_____
Signed by the designated ROC/RO or Programme Manager	/ /	Signed by CLS Chief Executive Officer Christophe VASSAL	/ /

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ANNEX XI

REPORT OF THE JTA REVIEW GROUP

JTA history - Sheet 1

How the Argos JTA was borne.

The Argos Data Collection and Platform Location System, called Argos Data Collection System and referred to hereafter as "Argos" or "the Argos System", results from a close and long-standing cooperation between the National Oceanographic and Atmospheric Administration (NOAA) of the United States of America and the Centre national d'études spatiales (CNES) of France.

The cooperation between NOAA and CNES for the implementation and the use of Argos is governed by a Memorandum of Understanding (MoU), renewed as and when necessary: The first such MoU was signed in 1974 and the second in 1986. Under the MoU, CNES is responsible inter alia for the Argos data processing system. Service Argos, the CNES department in charge of Argos operations, was entrusted with performing that task. [In 1986, Service Argos was transformed into the separate dual company (Collecte Localisation Satellite - CLS, and Service Argos Inc. - SAI, known as CLS/Service Argos), subsidiary corporation of CNES, which we still know by the end of 2005.]

Platform allocation, verification of the calibration data, system quality control, conversion of telemetry data into physical variables, computation of platform location, etc., which are part of Argos data processing, involve significant expenses. In that regard, a CNES objective has always be to achieve a self-sustaining system, with revenues from users fully offsetting operating costs. The Operations Committee (OpsCom), established by the afore-mentioned MoU to review the implementation and supervise the operations of the Argos system, has inter alia to review and concur in CNES (i.e. now CLS/Service Argos) proposals for the structure of the tariffs for the processing of data.

The French Government, as a contribution to the First GARP Global Experiment (FGGE, the Global Weather Experiment), had agreed to provide free platform location and data processing for FGGE related platforms during the operational year (1 December 1978 through 30 November 1979). At the end of that period (and with the exception of FGGE buoys still in operation), users had to face the obligation of buying (perhaps for the first time ever) a scientific satellite service, and to pay the rates established by CNES/Service Argos or negotiate individually with them. Wishing to simplify their own negotiations with potentially many United States users, Service Argos offered the prospect of a single price covering many users. In this respect, a meeting was held on 30 April 1979 to discuss a "global" contract which would cover users from NOAA and other agencies.

As a result of this meeting, a "Tariff MoU" was adopted by NOAA and CNES on 14 December 1979. In this MoU, NOAA and CNES agreed on Terms and Conditions covering user charges for platform location and data processing associated with the implementation and testing of platforms communicating through the Argos System. A Committee, with equal representation from NOAA and CNES, was established to review the Terms and Conditions as appropriate on a yearly basis.

The objective of this cooperative effort was to provide fair, cost-effective and simple procedures for United States users of the system. Programmes eligible for the preferential tariff under this agreement were limited to those funded by the government and/or non-profit agencies. Users funded, even partly, by private companies or organizations could not be included in the agreement, even if the data were supplied free of charge to national or international organizations.

In 1981, at WMO EC-XXXIII, the United States recommended that an international

agreement be established to provide relatively inexpensive processing costs to all interested countries. The main motivation for this recommendation was to expand the World Weather Watch (WWW) in terms of surface pressure measurements in data sparse regions, with possible additional advantages of a more timely and accurate mobile ship programme and more information for the Integrated Global Ocean Services System (IGOSS). WMO convened the first Argos Joint Tariff Agreement (JTA) meeting in Geneva (December 1981). Invitations were sent to all WMO Members. Nine countries participated and common Terms and Conditions, patterned after the U.S. agreement, were adopted under the name "Global Agreement".

During the first four meetings, numerous questions relating to drifting buoy programmes were raised under the JTA Meeting. That led the fourth meeting to support the establishment of an "international consortium" for the co-operative implementation of drifting buoy programmes, as requested by WMO EC-XXXVI (1984). With regard to its relationship with the future consortium, the JTA Meeting emphasized that (i) the consortium should not take over negotiations for the Global Tariff Agreement, but that the JTA meetings should continue in their present form for the foreseeable future; and that (ii) consideration be given to the future co-ordination of consortium and Argos JTA meetings (consortium meetings coming first). The consortium was established (in 1985) under the name of Drifting Buoy Cooperation Panel (DBCP), later on renamed Data Buoy Cooperation Panel.

IOC EC-XVII (in February 1984) proposed, and WMO agreed, to host the annual JTA meeting in turn with WMO. Beginning with the fifth meeting, and continuing today, the JTA meeting is served by the two Secretariats at once. The JTA has proven to be an effective, constructive and cooperative organizing and negotiating mechanism which has contributed significantly to the stability of the Argos system and its globally expanded applications.

JTA history - Sheet 2

List of Argos JTA meetings held up to 2006.

Meeting #	Place	Dates
I	Geneva, Switzerland	7-10/12/1981
II	Geneva, Switzerland	23-26/11/1982
III	Geneva, Switzerland	8-10/11/1983
IV	Paris, France	6-8/11/1984
V	Toulouse, France	17-19/10/1985
VI	Geneva, Switzerland	20-22/10/1986
VII	Paris, France	26-28/10/1987
VIII	New Orleans, La, USA	24-26/10/1988
IX	Geneva, Switzerland	23-25/10/1989
X	Melbourne, Australia	24-26/10/1990
XI	Toulouse, France	21-23/10/1991
XII	Paris, France	19-21/10/1992
XIII	Athens, Greece	25-27/10/1993
XIV	La Jolla, Ca, USA	7-9/11/1994
XV	Pretoria, South Africa	23-25/10/1995
XVI	Henley-on-Thames, UK	28-30/10/1996
XVII	Saint-Denis, La Réunion, France	20-22/10/1997
XVIII	Marathon, Fl, USA	19-21/10/1998
XIX	Wellington, NZ	1-3/11/1999
XX	Victoria, Canada	23-25/10/2000
XXI	Perth, Australia	29-31/10/2001
XXII	Trois Ilets, Martinique, France	21-23/10/2002
XXIII	Angra dos Reis, Brazil	27-29/10/2003
XXIV	Chennai, India	25-27/10/2004
XXV	Buenos Aires, Argentina	24-26/10/2005
XXVI	La Jolla, Ca, USA	23-25/10/2006

JTA history - Sheet 3

Argos JTA meetings achievements

[*Note*: developments of and improvements in Argos System are not quoted in this table. They might be listed in a separate "achievements sheet", should CLS so wish.]

# (year)	Countries attending	Global Agreement	Others	Comments
I (1981) Geneva	Argentina, Australia, Canada, Denmark, France, FRG, Netherlands, Norway, USA (9)	➢ Concept and definition of ROCs. ➢ Concept of a "minimum guaranteed number of PTT-years" for the Global Agreement (*min nb*) ***and*** per ROC. The *min nb* is initially confused with the number foreseen for next year at the annual meeting (*nb bid*). ➢ Definition of 2 "standard" services & associated charges, i.e. platform location (*basic rate*) or data collection only (fraction of basic rate, initially 1/5). ➢ In 1982, *nb bid*: 237; *basic rate*: 22 800 FF (3 476 €). ➢ 3 "limitations on PTT's": number & length of sensors; modifications of platform characteristics; max number of locations or data acquisitions. ➢ Policy for billing & payments (min 60 % in advance). ➢ "General conditions of Agreement", part (5), stipulates: "*Additional charges will be levied on the participating countries using more platform-years than originally included in this Agreement <u>only when and if</u> the total usage by all participants in the Global Agreement exceeds the sum of all platform-years initially contracte*d."	➢ Review of drifting buoy (DB) data exchange over the GTS & related consultations. ➢ Review of requirements for archiving of DB data. ➢ Possible establishment of a "Meteorological & Oceanographic Joint International Committee", with a technical coordinator positioned at Service Argos.	

# (year)	Countries attending	Global Agreement	Others	Comments
II (1982) Geneva	Australia, Canada, Denmark, France, FRG, Netherlands, Norway, USSR, USA (9)	➢ Addition of "back-up" & "monitoring" services & associated charges (defined as fractions of basic rate). ➢ In 1983, *nb bid*: 260; *basic rate*: 24 000 FF (3 659 €). ➢ In 1984, the *basic rat*e will remain unchanged if *nb bid* reaches 310 at least.	➢ LUT role in addition to central Argos data processing centre (& possible connection of both) highlighted; LUTs encouraged putting data onto the GTS. ➢ Proposal to equip VOS with PTTs. ➢ Review of DRIBU code & relevant standard rules. ➢ Outline of the "Guide to data collection & location services using Service Argos" prepared. ➢ Offer by FRG to allow others to install pressure sensors on their oceanographic buoys.	
III (1983) Geneva	Canada, Denmark, France, Netherlands, Norway, UK, USA (6)	➢ In 1984: *nb bid*: 316; *basic rate*: unchanged.	➢ Nb. of active platforms has nearly doubled. ➢ Proposal for transmission of sub-surface temperatures accepted (implies standardization of buoy hardware). ➢ Review of system options in the future (90's). ➢ WMO Congress considered that the annual Argos JTA meeting "*had been a prime factor in the promotion of the drifting buoy programme*". ➢ "Guide to data collection & location services using Service Argos" published & distributed; rev. edition foreseen in 1984 (with e.g. more oceanography). ➢ Discussion on a formal mechanism for coordination between the met. & ocean. communities in DB activities (refers to coming TOGA), and on coordination of buoy deployments for TOGA. ➢ Offer by MEDS to act as a long-term archival centre for DB data supplied by Service Argos (cost shared with USA). ➢ Need for a technical coordinator at Service Argos (esp. for TOGA); defines ToRs; looks at funding. ➢ Use of the WWW Monthly Newsletter to provide up-to-date information to Members, e.g. allocation of identifier numbers, activities re. automatic marine stations, etc.	

# (year)	Countries attending	Global Agreement	Others	Comments
IV (1984) Paris	Australia, Canada, Denmark, France, FRG, Netherlands, Norway, Saudi Arabia, Spain, UK, USA (11)	➢ The "limitations on PTTs" regarding number & length of sensors is eliminated, & the charges for the other two are slightly modified. ➢ A 1st "plan" is introduced, to balance the Service Argos budget in 1990 & following years, with users paying all costs except those related to spacecraft. That would represent an annual increase of 15 % of the sum to be paid under the Global Agreement, before allowing for inflation. ➢ Within that plan, it is proposed to replace the Argos obsolete computing equipment and to establish a 2nd processing centre, fully redundant, in the USA. ➢ In 1985: *nb bid*: 414; *basic rate*: 23 000 FF (3 506 €) (computed, as for future years, with the formula deduced from the plan).	➢ Inclusion of pressure tendency in the DRIBU code being prepared. ➢ Convening by IOC & WMO of a meeting to establish an international "consortium" for the cooperative implementation of DB programmes; recommendations submitted in that respect (incl. for the position of technical coordinator at Service Argos). ➢ Future relationships with the "consortium" defined. ➢ Review of the status of DB data archiving. ➢ Request that the WWW Monthly Newsletter publish the full list of platforms reporting through Argos in each issue.	1st JTA meeting hosted by IOC.
V (1985) Toulouse	Brazil, Canada, France, FRG, Iceland, Netherlands, Norway, Spain, UK, USSR, USA (11)	➢ Problem of "excess utilization" recognized (some participants use significantly more PPT-years than their *nb bid*, in an attempt to benefit from "General conditions of Agreement", part (5) - see 1st meeting); the related "excess payment" will be used as a credit against next year costs. "General conditions of Agreement", part (5), is modified accordingly. ➢ In 1986: *nb bid*: 490; *basic rate*: unchanged.	➢ Possible saturation of the Argos system in some parts of the globe quoted for the 1st time. Various possible solutions reviewed. ➢ Problems of delays in data delivery due to space segment quoted. ➢ Discussion on possible standard Argos formats to report XBT or wave data in various WMO code forms. ➢ The DBCP has been established by WMO & IOC.	1st JTA meeting held right after a DBCP session, served jointly by IOC & WMO Secretariats.

# (year)	Countries attending	Global Agreement	Others	Comments
VI (1986) Geneva	France, FRG, Netherlands, Norway, USSR, UK, USA (7)	➢ Regarding the "excess use" problem, "General conditions of Agreement", part (5), is reworded to (i) cope with any "global" and/or "individual" excess use within the Global Agreement, and (ii) arrange for the credits/rebates so computed to apply to the year in which the excess was incurred. ➢ Proposal by CLS to include a new paragraph under the "General conditions of Agreement" referring to limitations of liability on the part of CLS resulting from unauthorized use of the Argos system: rejected. ➢ In 1987: *nb bid*: 575; *basic rate*: unchanged;.	➢ Possible saturation of the Argos system, essentially due to an inefficient satellite usage: defers discussion on proposal to change the Argos tariff structure to relate individual tariff to "satellite use factor"; recommends that the Operations Committee apply strict "rules for use" in selecting acceptable programmes. ➢ CLS has developed a standard format to report XBT data in near-real-time, which can accommodate met. data too. Request that the format be enlarged to accommodate thermistor chains too & that CLS document its product with full details.	Service Argos has become CLS/Service Argos (referred to hereafter as CLS)
VII (1987) Paris	Cameroon, Canada, China, France, Iceland, Netherlands, Norway, UK, USA (9)	➢ Proposal to remove the "monitoring" service: agreed, with a change in "back-up" charges coefficients. ➢ In 1988: *nb bid*: 664; *basic rate*: 23 500 FF (3 583 €); if *nb bid* reaches *min nb*, i.e. 681 by 15 January, back to unchanged [which happened].	➢ Proposal for new tariff structure based on "satellite use factor" (to try & cope with inefficient satellite usage): rejected for its complexity & inherent uncertainties. ➢ Argos special XBT service fully operational.	
VIII (1988) New Orleans	France, FRG, Iceland, Netherlands, Norway, UK, USA (7)	➢ 1st presentation of a philosophy for the JTA after 1990 (see 9th meeting). ➢ In 1989: *nb bid*: 715; too low, would raise the *basic rate* to 26 000 FF (3 964 €). Need to take measures to alleviate the problem: 1° changes in charges coefficients; 2° *min nb* computed as number of PTT-years committed by 15 January + 3 % (estimate of total "excess usage").		

# (year)	Countries attending	Global Agreement	Others	Comments
IX (1989) Geneva	Brazil, China, France, Netherlands, Norway, UK, USA (7)	➢ In 1989: *min nb* computed: 755; *basic rate*: 24 520 FF (3 738 €). ➢ JTA structure after 1990 based on 2 principles: (i) keep CLS operating; and (ii) pay off over years the losses accumulated by CLS during 1985-1990. Proposal agreed (see 10th meeting). ➢ In 1990, *nb bid*: 738; too low, would raise the basic rate to 29 670 FF (4 523 €). Measures adopted: 1° decrease from 15 to 12 % the figure used to compute the sum due by the JTA (see 4th meeting); 2° use numbers committed by 15 January to compute the *basic rate*; 3° "late committed" PTT-years & "excess use" will be billed at the computed *basic rat*e + 25 %, with a few exceptions; 4° specific problems will be reviewed on an individual basis by CLS & the chair.	➢ Proposal to develop a new "GTS processing chain": agreed in principle by the DBCP. ➢ Formal request to CLS to study possible implementation of SYNOP code for fixed automatic land stations.	
X (1990) Melbourne	Australia, France, Iran (Isl. Rep. of), Netherlands, New Zealand, UK, USA (7)	➢ In 1990, *min nb* computed: 770; *basic rate*: 27 790 FF (4 237 €). ➢ Request by SVP community to consider PTTs third of time on only: agreed as "Standard Scientific Service" (SSS), fully specified in Terms & Conditions. ➢ Detailed proposal for a ten-year plan for Argos funding after 1990, with JTA (i) providing at least 50 % of Argos operating costs (*guar min*), & (ii) repaying 35 % of losses during 01/01/1984-31/12/1990: agreed (new formula). ➢ Proposal for a "monthly service charge" for Argos users: postponed, to be reviewed next year. ➢ In 1991, *nb bid*: 896; *basic rate*: unchanged; any excess over *guar min* applied to accumulated loss.	➢ DBCP proposal that the development of the new "GTS processing chain" be partly funded through the JTA: agreed, since it is as an Argos system development. ➢ More generally, the JTA participants request to have the opportunity to input into the planning & implementation of Argos system developments (50 % funded through the JTA): agreed.	

# (year)	Countries attending	Global Agreement	Others	Comments
XI (1991) Toulouse	Denmark, Finland, France, Netherlands, Norway, UK, USA (7)	➢ Request by scientific community to modify the conditions for SSS: agreed. ➢ CLS demonstrates the large discrepancy between the JTA prices & the actual processing costs. Agreement on phased modifications to the existing tariff structure, beginning in 1993 & to be reviewed at next meetings. ➢ In 1992, *nb bid*: 1056; *basic rate*: unchanged; any excess over *guar min* applied to accumulated loss.	➢ IOC requests cooperation between the Argos tide-gauge network & GLOSS. ➢ Argos proposals for system developments, incl. the new "GTS processing chain" & an Argos processing centre in Japan: agreed.	Concept of "minimum use charge" envisaged for the 1st time
XII (1992) Paris	Australia, China, Denmark, France, Madagascar, Netherlands, Norway, UK, USA (9)	➢ Begin changes in coefficients, as agreed at 11th meeting. ➢ Postpone introduction of "System Use Service", which would apply to all platforms using Argos & be the minimum tariff applicable when no additional service (such as data collection or platform location) is required. ➢ In 1993, *nb bid*: 1074; *basic rate*: unchanged; any excess over *guar min* applied to accumulated loss.	➢ The meeting reiterates its concern that cost of data communications from platform to user might become a limiting factor in the use of unattended equipment. Hopes some innovative solution. ➢ CLS experiencing cash flow difficulties. Remedial actions suggested, involving CLS procedures for invoicing ROCs.	
XIII (1993) Athens	Australia, Brazil, Canada, Denmark, France, Greece, Netherlands, Norway, Tunisia, UK, USA, Yemen (12)	➢ No agreement on principles for long-term evolution of the tariff structure; problems to be dealt with on a case-by-case basis. ➢ Introduction of "Inactive Status", applying to platforms previously under a "standard" service (see 1st meeting) & no longer of any use to owner or the community. ➢ Other changes in coefficients. ➢ SSS renamed "Limited Use Service" (LUS). ➢ In 1994, *nb bid*: 1166; *basic rate*: lowered to 27 000 FF (4 116 €); any excess over *guar min* applied to accumulated loss.	➢ Request that automatic data distribution through Internet, implemented at US GPC, become available from French GPC: agreed. ➢ CLS cash flow difficulties largely alleviated thanks to ROCs cooperation & new invoicing procedures.	

# (year)	Countries attending	Global Agreement	Others	Comments
XIV (1994) La Jolla	Australia, Brazil, China, France, Netherlands, South Africa, UK, USA (8)	➢ Revision of funding agreement (see 10th meeting): JTA proportion of operating costs will be raised to 60 % progressively over 1995-1997. ➢ In 1995, *nb bid*: 1220; *basic rate*: lowered to 26 000 FF (3 964 €); any excess over *guar min* applied to accumulated loss.	➢ CLS proposal to process & distribute over GTS data collected by regional LUTs, e.g. in Australia: agreed.	
XV (1995) Pretoria	Australia, Brazil, France, Germany, Iceland, Netherlands, New Zealand, Norway, Ukraine, South Africa, UK, USA (12)	➢ Participants budget constraints & their relationship to Argos operating costs quoted for the 1st time. ➢ Proposal for an Argos ID charge & a minimum use charge: rejected. ➢ Adoption of an ID charge to encourage the recycling of unused user IDs. ➢ Request by sea mammal trackers to be included in LUS: rejected, to be reviewed at future meetings. ➢ In 1996, *nb bid*: 1229; *basic rate*: lowered to 25 750 FF (3 926 €); any excess over *guar min* applied to accumulated loss.	➢ Request by some users to get data from a 3rd satellite: endorsed, with increased processing costs considered as value added service. ➢ Problems with new Argos location algorithm: to be studied by USA & CLS. ➢ JTA tariff applied to platforms deployed by commercial organizations in IABP for the express purpose of contributing to formal DBCP programmes (not counted under JTA): agreed.	1st scientific & technical workshop during DBCP-XI
XVI (1996) Henley-on-Thames	Australia, Brazil, Canada, China, Denmark, France, Netherlands, Norway, South Africa, UK, USA (11)	➢ Proposal for an Argos Large International Programme (ALIP), aiming at encouraging more platforms to convert to full-time status with GTS distribution: to prepare a more concrete & specific proposal; interim ALIP to be tried in 1997. ➢ CLS proposal to attempt to reduce actual 1997 operating expenses: warmly welcome. ➢ Timetable & amount for unused ID charge agreed upon. ➢ Platforms in LUS may transfer to "Inactive Status". ➢ Wording under "Conditions for LUS" modified to cope with marine mammal trackers requirements. ➢ In 1997, *nb bid*: 1123; *basic rate*: 26 000 FF (3 964 €) [risk taken by CLS].	➢ French GPC connected to Internet in 1996. ➢ DBCP requirement for implementing a LUT in South Africa for ISABP as an Argos development project: agreed. ➢ Buoy user requirements presented in a prioritized list to DBCP: agreed as Argos development project.	Concept of large number of ± identical buoys with common objectives incl. real-time GTS distribution: quoted for the 1st time

# (year)	Countries attending	Global Agreement	Others	Comments
XVII (1997) Saint-Denis	Australia, Brazil, Canada, France, Iceland, Netherlands, New Zealand, Norway, South Africa, UK, USA (11)	➢ JTA share of Argos accumulated losses 1984-1990 (see 10th meeting) fully erased during 1996. ➢ Interim ALIP didn't meet its aims (see 16th meeting): the ALIP concept will disappear. ➢ Establishment of the "bonus" system (2-year agreement). ➢ The 25 % penalty for "excess use" (see 9th meeting) will no longer apply. ➢ In 1998, *nb bid*: 1119; *basic rate*: unchanged [again, risk taken by CLS].	➢ The scientific community warns the meeting that climate-related programmes such as CLIVAR will lead to a substantial increase in ocean observing platform requirements. That may deeply modify JTA arrangements in future.	
XVIII (1998) Marathon	Australia, Brazil, Canada, Denmark, France, Iceland, Netherlands, New Zealand, Norway, South Africa, UK, USA (12)	➢ Argos operating deficit recognized (*nb bid* used at JTA-XVII too low to balance costs) & no inflation allowed: 1. specific measures taken for 1999; 2. fixed monthly fee per active platform as from 2000 onwards; 3. penalty charge of 25 % for overuse (once the bonus is taken into account) reintroduced. ➢ In 1999, *nb bid*: 1110; *basic rate*: unchanged	➢ 4 specific recommendations from DBCP: accepted within the Argos development programme. ➢ Question concerning the apparent differential in charging rates for US & other system users: definite statement of position from the OpsCom closes the matter.	
XIX (1999) Wellington	Australia, Brazil, Canada, France, Netherlands, New Zealand, Norway, South Africa, Thailand, Ukraine, UK, USA (12)	➢ New Argos operating deficit, for the 2nd year. Bonus system maintained; five-year plan (2000-2004) adopted: 1. 2 % annual inflation for operating costs; 2. JTA share of the costs progressively decreased from 60 to 52 %; 3. *Active Platform Fee* phased in during the period from 10 to 50 FF/month (1.52 to 7.62 €); 4. *basic rate* progressively increased from 26 000 to 27 000 FF (3 964 to 4 116 €); 5. *unused ID charge* phased out over the period (subject to review); 6. free access to 3rd satellite for animal trackers. ➢ In 2000, *nb bid*: 1113; *basic rate*: 26 200 FF (3 994 €).	➢ Potential value to users of using the full communication bandwidth: pb still pending in 2006. ➢ DBCP requirements for South Atlantic: adopted (the question of "the Brazilian satellite" still unsolved in 2006). ➢ Details of JTA and non-JTA activity in terms of active IDs & revenue made available for the 1st time. In future, this information could be used to help adjust the JTA share of operating costs.	

# (year)	Countries attending	Global Agreement	Others	Comments
XX (2000) Victoria	Australia, Brazil, Canada, France, Netherlands, New Zealand, Norway, South Africa, UK, USA (10)	➢ Stick on the 5-year plan adopted last year. ➢ Continue to operate the *unused ID charge*. ➢ In 2001, *nb bid*: 1123; *basic rate*: 26 400 FF (4 025 €).	➢ To develop a BUFR encoder for incorporation into the Argos GTS processing sub-system by 2003, as part of the Argos development programme: agreed, since no direct impact on Argos funding plan. ➢ A/B class locations to be eventually included under the JTA (for animal trackers): agreed, with phased approach over a 3-year period (cost decreased by 1/3 per year).	
XXI (2001) Perth	Australia, Canada, France, Italy, Korea, Netherlands, New Zealand, South Africa, UK, USA (10)	➢ OpsCom agreed to de-couple the JTA share of Argos operating costs from the actual figure as from 2001 & use the 2000 figure + 2 % inflation. ➢ In 2002, *nb bid*: 1150; *basic rate*: 4 055 € (26 600 €)	➢ To develop an Argo QC module in the Argos GTS sub-system: agreed. ➢ To enhance the Argos GTS sub-system to relay data from other sources: agreed in principle (feasibility study). ➢ JTA independent chairman funded through the JTA: agreed (as in future, at least up to 2006).	
XXII (2002) Trois Ilets	Australia, Canada, Denmark, France, Italy, Korea, Netherlands, New Zealand, South Africa, UK, USA (11)	➢ Pb with unexpected over use for the US ROC: to be solved by SAI; resulting additional income used to freeze the *basic rate* for 2 years. ➢ Adjustment of the rule regarding the penalty charge for "*excess use*". ➢ In 2003, *nb bid*: 1187; *basic rate*: unchanged.	➢ To enhance the Argos GTS sub-system to relay data from other sources: agreed for implementation. ➢ Request to reactivate the Lannion ground station (pb of the "*blind orbit*"): to communicate to OpsCom.	
XXIII (2003) Angra dos Reis	Australia, Brazil, Canada, France, Netherlands, New Zealand, Korea, South Africa, UK, USA (10)	➢ The 5-year plan (see 19th meeting) would have proven fully successful; USA agrees to increase its bid to reduce the *basic rate*. ➢ In 2004, *nb bid*: 1386; *basic rate*: 3 850 €. ➢ OpsCom requests a simplified, robust framework for future Global Agreements: basic aims & principles agreed upon, as well as constraints & consequences. Intersessional working group established.	➢ *Blind orbit*: undertaking to enhance a receiving station at Barrow. Pb still pending in 2006. ➢ To employ data compression to reduce BUFR message length on the GTS: agreed.	

# (year)	Countries attending	Global Agreement	Others	Comments
XXIV (2004) Chennai	Australia, Canada, China, France, India, Netherlands, New Zealand, South Africa, UK, USA (10)	➢ Proposed new tariff structure: 1. *basic rate* = A + B × nb of day units, where A = monthly charge per active PTT, B = PTT-day rate, day units made up of 4 "*time slots*"; 2. B = B1 + B2, where B1 ↔ data volume (e.g. floats) B2 ↔ workload for Argos (e.g. animal tracking); 3. discount scheme for large nbs of platforms; 4. invoicing upon consumption every 2 months. ➢ New structure agreed in principle. Implemented as a pilot programme during 2005 by volunteers.	➢ 1st presentation on OCO: well received.	
XXV (2005) Buenos Aires	Australia, Canada, China, France, New Zealand, Korea, South Africa, UK, USA (9)	➢ New tariff structure agreed upon for everybody from 2006 onwards. ➢ CLS to assess whether the B coef. should be adjusted to cope with applying time slot computation to all categories. ➢ Other possible algorithms to be evaluated. ➢ In 2006, no change in coefficients. ➢ CLS to report on costs to be attributed to the JTA by end August each year.	➢ Delays in data reception: CLS (& TC) to continue identify technical reasons & measures to be taken. To monitor delays routinely. ➢ CLS to investigate ways & means of improving coverage in equat./trop. area, incl. LUTs in Easter Island & Saint Helena (+ Brazilian satellite). ➢ CLS to propose appropriate pricing strategy re. ADS costs for users in Polar regions. ➢ To study the specific case of OCO in various ways. ➢ To initiate thoughts on the future of the JTA.	

JTA history - Sheet 4

Some thoughts & remarks about JTA achievements

During the first 4 years, the JTA meeting was concerned with what is now the responsibility of the DBCP, in addition to its "specific duties". The way it discharged the former - concepts of technical coordinator hosted by Service Argos, of a specific mechanism to take care of DB activities, etc. - shows it did a good job and had a clear vision of the future.

Regarding its specific duties, it is obvious that many progresses and developments were originating from Argos proposals. The initiatives and the dynamism of CLS/Service Argos (or its predecessor) are to be commended. But all those proposals had to be presented within a well suited forum, discussed, evaluated, weighed against other possibilities. All possible "pros and cons" (hopefully) had to be listed and reviewed. It is clear that the Meeting on Argos JTA was instrumental in providing such a forum.

A typical example of the efficient use of that forum may be found at the 4th meeting (Paris, 1984), where Service Argos, for the first time, submitted a dual proposal to (i) agree on a plan whereby the users would pay for *all* Service Argos costs (except spacecraft-related), beginning in 1990, and (ii) take the opportunity of renewing the Argos computing equipment to establish a second, fully redundant processing centre in the USA. Service Argos made then clear "*that the proposal had not yet been considered by CNES management or by the Argos Operations Committee, but was being presented in the context of the Meeting on the Global Agreement for the purpose of determining users' reaction.*" (summary report of the meeting, para. 7.2). The ensuing discussion demonstrated what the users' standpoint was about and proved useful in getting OpsCom approval of the proposal in due course.

Another example shows the same efficiency with an opposite result, so to say. At the 6th meeting (Geneva, 1986), CLS proposed the inclusion of a new paragraph under the "Terms and Conditions" referring to limitations of liability on the part of CLS resulting from unauthorized use of the Argos system. The idea was to warn ROCs of the potential legal and other difficulties which might arise through unauthorized use of Argos PTTs in situations which involved in particular the safety of human life, as well as to attempt to limit the liability of CLS in such situations. "*While expressing its sympathy with CLS [...], the meeting nevertheless felt very clearly that it should not be involved in any way in questions of this nature relating to legal liability. It agreed that the essential purpose of the annual JTA meeting was simply to provide a forum in which a preferential tariff could be negotiated with Service Argos, thereby hopefully facilitating an increase in the numbers of platforms deployed.*" (final report of the meeting, para. 7.4)

In other circumstances, initiatives came from the JTA participants themselves. A typical example may be found during the 10th meeting (Melbourne, 1990), where actual interaction between the JTA and Argos developments began. At that meeting, for the first time and at JTA participants' request, CLS gave not only (and as usual at that time) a detailed breakdown of their operating costs, but in addition a further breakdown of the line "Amortization and specific costs": "*The meeting agreed that, since CLS is a non-profit making organization, any system developments must eventually be funded through user charges. In addition, such developments, in general, ultimately benefit all users in a variety of ways. Nevertheless, the meeting considered it important that JTA participants should have some opportunity to input into the planning and implementation of Argos system developments. This input could essentially be provided [...] through*

(i) annual scrutiny of the detailed "amortization" items in the operating budget;

(ii) prior consideration, at each annual meeting, of the new investment projects to be proposed by CLS, to be amortized in future years as a part of the operating costs."

(final report of the meeting, para. 5.5). Such *scrutiny* and *prior consideration* became a rule afterwards and may be considered as having had a rather positive impact for both the users of the Argos system and CLS itself.

In some cases, the JTA meeting was the unavoidable forum where to report difficulties and agree on solutions that encompassed some kind of "good will" on the part of the governmental users. An example of such a case may be found during the 12th meeting (Paris, 1992), where CLS informed the meeting of severe cash flow difficulties due to the billing policy. The meeting agreed to modify the procedures used by CLS to invoice the ROCs - it was the only body able to take such a decision and to obtain ROCs cooperation in that field. As a result, it was reported at the 13th meeting that the difficulties "*had now been largely alleviated*." (final report of the meeting, para. 6.5)

JTA-XVI (Henley-on-Thames, 1996) appeared to be the equivalent of JTA-XII, in the reverse way so to say. The situation was becoming more and more difficult for Argos users (inter alia). "*The meeting recognized that virtually all organizations, agencies and institutions participating in the JTA were continuing to experience budgetary and staff constraints and programme cuts, which were making it increasingly difficult for them to maintain previous levels of Argos PTT-year requirements with the existing price structure. In this context, it recalled the request made at JTA-XV for CLS/Argos to provide it with specific proposals for real Argos operating cost reductions, together with scenarios for the potential impacts of these on Argos services, as an aid in its considerations of how best to cope with possible future programme reductions.*" (summary report of 16th meeting, para. 30). The JTA was supposed to cover 60 % of CLS operating costs in 1997 and had previously agreed to fix a top limit of 26 000 FF (3 964 €) to the "basic rate" for a PTT-year. The number of PTT-years foreseen for 1997 was far too low to accommodate both requirements (e.g. sticking to 60 % of Argos operating costs would have led to a "basic rate" of 31 490 FF - some 4 800 €). "*The meeting therefore especially welcomed the offer by CLS/Service Argos to take the risk of fixing the price of the standard service per PTT-year to FRF 26 000 in 1997 and to review the situation at the next year meeting. [*The CLS chairman*] indeed explained that his company was keen to maintain a good spirit of co-operation with the JTA user community during a difficult period*." (summary report of the meeting, para. 41).

Some synthetic appreciations of the JTA and its meetings

JTA-VI (Geneva, 1986):

The meeting "*agreed that the essential purpose of the annual JTA meeting was simply to provide a forum in which a preferential tariff could be negotiated with Service Argos, thereby hopefully facilitating an increase in the numbers of platforms deployed.*" (final report of the meeting, para. 7.4)

JTA-XV (Pretoria, 1995):

"*... The Secretariats were asked to highlight, in their letter of invitation to each JTA session, the importance of the meeting as a global forum for user's view*." (final report of the meeting, para. 4.14).

JTA-XX (Victoria, 2000):

"*The meeting recalled that a primary purpose of the JTA and the annual meetings was to ensure that the Argos system met the basic requirements of all system user groups in the most cost-effective way, while preserving the financial and operational viability of CLS/Service Argos*." (summary report of the meeting, para. 20).

The meeting agreed that the bonus system had already very well served "*its basic purpose of expanding platform deployments and system usage at no substantive additional costs to users*." (summary report of the meeting, para. 32)

The new tariff structure

Having reviewed the history of the JTA meetings (see Sheet 3) and taken note of some of its salient aspects (see above), it is easier to understand why and how the *basic aims and principles for the JTA* were drafted at the 23rd meeting (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*.

The above words might perhaps have been more polished; paragraphs (iii), (iv) and (vii), that all refer to Argos system developments and how to fund them in relation to the JTA, might have been merged into a single one; etc. Nobody, nothing, is perfect. Those *basic aims and principles* reflect the experience of more than twenty years of thoughts, discussions, negotiations, attempts and proposals of various kinds, dealing with the same topic in a changing world. They led to a formula that, again, may perhaps be improved, but that seems to be convenient for a large proportion of users.

Preliminary conclusions

As a general comment, one may say that the JTA process provides an excellent model of how government agencies dealing with international funding can successfully interact with a non-profit, user-pay service.

Within the Meeting on Argos Joint Tariff Agreement, it appears that negotiations about pricing are only one aspect of the overall undertaking - even if a pretty important one. The JTA meetings have played an important role in helping those who needed something like the Argos system to obtain (more or less) what they wanted, and CLS/Service Argos to foresee what they had to do to go on meeting their users' requirements. In some way, one could compare the JTA Meeting with the CEOS: both play the fundamental role of providing for the global forum where users and providers can discuss and prepare for future.

The JTA is a remarkably robust example of how international cooperation can be successfully managed at the working level for a quarter of a century. It continues to provide an effective, self-governing global forum through which real needs and requirements can be presented, proposals submitted and reviewed, and realistic, binding actions and decisions taken.

There are currently more than 16,000 platforms transmitting at least once per month through the Argos system. A large percentage of these are for scientific purposes and belong to JTA participating countries. Many if not all of these platforms will most certainly continue to operate and their programmes will likely experience some growth in the next 2 to 5 years. It is

therefore essential that the JTA mechanism, or one like it, continues to exist in order to provide the constructive and scheduled forum that enables the much needed exchange of user requirements and Argos system capabilities.

The JTA concept of one individual representing the users in a participating country has been very successful and should remain. Annual meetings should continue as long as they remain useful and focused. It is possible that during periods of strong JTA stability the annual meeting could be shortened (one day or less) and be convened during the week of, and as an adjunct to, the Data Buoy Cooperation Panel session. It would also be appropriate for the JTA members to invite designated representatives of JTA applications areas to specific meetings to understand more fully the needs of the diverse JTA user community.

ANNEX XII

THE PERMANENT JTA REVIEW MECHANISM (Jrev)

Terms-of-reference:

1. to review annually (as necessary)
   (i) the objectives of the JTA and assess whether they are being achieved;
   (ii) the "basic aims and principles for the JTA", and propose amendments as necessary; and
   (iii) the role of the ROCs;

2. to consider the nature & duration of the next JTA meetings;

3. to report to each JTA meeting.

Membership:

- Chairman
- CLS (F & USA)
- Joint JCOMM Secretariat
- NOAA & CNES OPSCOM reps.
- user segment reps. (chair DBCP, wildlife – Mike Fedak, others as necessary)
- ROCs rep. (nominated annually by the ROCs - Julie Fletcher)

Modus operandi:

- during the intersessional period, the chair will lead the required reviews via electronic mail;

- the chair will propose a draft synthesis for review by the members during June;

- the chair will submit & present a final report to the meeting.

Of course, members may address the chair any time on any topic.

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ANNEX XIII

NATIONAL REPORTS ON CURRENT AND PLANNED PROGRAMMES

The Following national reports were received by the Secretariat:

Canada
France
The Netherlands
United Kingdom

Country: Canada

Year: 2006

A. Agency or programme: Environment Canada (Sandi Lee/John Elliott)

Purpose of programme: Program #01375 – Seasonal Movements of Osprey

Numbers and types of platforms: (a) deployed current year: 2 Animals

(b) planned next year: 5 animals

Estimated number of PTT-years: (a) current year: 0.6 years for 2006

(b) next year: 3.3 PTT years for 2007

B. Agency or programme: Environment Canada (Sandi Lee/Sean Boyd)

Purpose of programme: Program #11375 – Seasonal Movements of Brant

Numbers and types of platforms: (a) deployed current year: 15 Animals

(b) planned next year: 0 animals

Estimated number of PTT-years: (a) current year: 2.2 PTT years for 2006

(b) next year: 0

C. Agency or programme: Environment Canada (Sandi Lee/Sean Boyd)

Purpose of programme: Program #31375 – Seasonal Movements of Scoters

Numbers and types of platforms: (a) deployed current year: 17 Animals

(b) planned next year: 0 animals

Estimated number of PTT-years: (a) current year: 1.3 PTT years for 2006

(b) next year: 0

D. Agency or programme: Environment Canada (Sandi Lee/Sean Boyd)

Purpose of programme: Program #21375 – BOAS: Pelagic Bird Tracking

Numbers and types of platforms: (a) deployed current year: 10 Animals

(b) planned next year: 30 animals

Estimated number of PTT-years: (a) current year: 3.6 PTT years for 2006

(b) next year: 9.1 PTT years for 2006

E. Agency or programme: Environment Canada (Sandi Lee/Sean Boyd)

Purpose of programme: Program #22375 – BOAS: Coastal Bird Tracking

Numbers and types of platforms: (a) deployed current year: 23 Animals

(b) planned next year: 60 animals

Estimated number of PTT-years: (a) current year: 8.9 PTT years for 2006

(b) next year: 12.2 PTT years for 2006

F. Agency or programme: Canadian Wildlife Service (2443)

Purpose of programme: Monitoring Wildlife Movements

Numbers and types of platforms: (a) deployed current year: 2

(b) planned next year: 2
mobile transmitters on birds

Estimated number of PTT-years: (a) current year: 0.04

(b) next year: 0.22

G. Agency or programme: Canadian Wildlife Service (3082)

Purpose of programme: Greater Snow Goose monitoring

Numbers and types of platforms: (a) deployed current year: 25

(b) planned next year: 25

Estimated number of PTT-years: (a) current year: 0.97

(b) next year: 3.1

H. Agency or programme: Department of Environment and Natural Resources (2814)

Purpose of programme: Monitor of Boreal Caribou in Dehcho region of NWT.

Numbers and types of platforms: (a) deployed current year: 13
4 VHFs and 9 Telonics ST-20

(b) planned next year: 24
Telonics Agos-GPS and ST-20

Estimated number of PTT-years: (a) current year: 4.12

(b) next year: 5.3

I. Agency or programme: Dept of National Defence (2019)

Purpose of programme**:** Location of personnel in open water after a shipping disaster. The buoy allows rescue craft, either aircraft or vessels, to focus their search patterns into specific areas by emulating the drift patterns of either a person floating in a life vest or a four-man life raft.

Numbers and types of platforms: (a) deployed current year: 48

Each buoy is deployed for 5 days for a total of 240 PTT days.

(b) planned next year: 48

Each buoy is deployed for 5 days for a total of 240 PTT days.

Estimated number of PTT-years: (a) current year: .60 PTT year

(b) next year: .60 PTT year

J. Agency or programme: Fisheries & Oceans-Bedford Institute of Oceanography (76)

Purpose of programme: Met/ocean research

Numbers and types of platforms: (a) deployed current year:

- 1 directional wave rider (Apr-Nov)
- 2 surface drifters(SLDMB)
- 4 surface drifters with GPS

(b) planned next year:

- 1 directional wave rider (Apr-Nov)
- 2 surface drifters(SLDMB)
- 4 surface drifters with GPS
- 6 ice drifters with GPS

Estimated number of PTT-years: (a) current year: was 1.7 now 1.0

(b) next year: 1.5

K. Agency or programme: Marine Mammal Research Unit (3002)

Purpose of programme: Monitor Stellar Sea Lions

Numbers and types of platforms: (a) deployed current year: 9

(b) planned next year: 0

Estimated number of PTT-years: (a) current year: 2.5
(b) next year: 0

L. Agency or programme: Environment Canada, Water Science and Technology, Lagrangian Drifter Buoys. (3041)

Purpose of programme: to monitor Clearwater Code 4 Lagrangian Drifter Buoys to measure surface water currents for intermittent projects (i.e. not for continuously use).

Numbers and types of platforms: (a) deployed current year: 5

(b) planned next year: 5

Estimated number of PTT-years: (a) current year: 0.5

(b) next year: 0.5

M. Agency or programme: Defence Research and Development Canada – Atlantic (Program 2176)

Purpose of programme: Wave measurement

Numbers and types of platforms: (a) deployed current year: 2 Wave Buoys

(b) planned next year: 2 Wave Buoys

Estimated number of PTT-years: (a) current year: 0.06

(b) next year: 0.1

N. Agency or programme: Fisheries and Oceans, Institute of Ocean Sciences, Witness Buoy mooring position monitoring (704)

Purpose of programme: Monitor Mooring Positions

Numbers and types of platforms: (a) deployed current year: 16 PTT

(b) planned next year: 10 PTT

Estimated number of PTT-years: (a) current year: 0.05

(b) next year: 0.05

O. Agency or programme: Ministère des Ressources naturelles et de la Faune du Québec (2857)

Purpose of programme: Study the behaviour of woodland caribou

Numbers and types of platforms: (a) deployed current year: 53
53 telemetry collars relaying GPS positions via an ARGOS link

(b) planned next year: 36
36 telemetry collars relaying GPS positions via an ARGOS link

Estimated number of PTT-years: (a) current year: 1.6

(b) next year: 1.2

P. Agency or programme: Parks Canada Agency (1015)

Purpose of programme: Grizzly Bear monitoring and bear management within Kluane National Park

Numbers and types of platforms: (a) deployed current year: 0

(b) planned next year: 1

Estimated number of PTT-years: (a) current year: 0

(b) next year: 0.1

Q. Agency or programme: Department of Environment, Government of Yukon (2589)

Purpose of programme: Wildlife monitoring

Numbers and types of platforms: (a) deployed current year: 1

(b) planned next year: 0

Estimated number of PTT-years: (a) current year: 0.04

(b) next year: 0

R. Agency or programme: Department of Environment, Government of Yukon (3346)

Purpose of programme: Wildlife monitoring

Numbers and types of platforms: (a) deployed current year: 0

(b) planned next year: 4

Estimated number of PTT-years: (a) current year: 0

(b) next year: 1

S. Agency or programme: Ministère des Ressources naturelles et de la Faune du Québec (959)

Purpose of programme: Caribou tracking in Northern Quebec

Numbers and types of platforms: (a) deployed current year: 41

(b) planned next year: 40

Estimated number of PTT-years: (a) current year: 3.16

(b) next year: 4.0

T. Agency or programme: Ontario Ministry of Natural Resources (2587)

Purpose of programme: Caribou Tracking to determine winter/calving grounds & travel routes

Numbers and types of platforms: (a) deployed current year: 1

(b) planned next year: 0

Estimated number of PTT-years: (a) current year: 0.1
collar just released off animal will be shutting it down.

(b) next year: 0

U. Agency or programme: Ontario Ministry of Natural Resources (8444)

Purpose of programme: Track caribou movements in the Lake Nipigon Region of Northwestern
Ontario near Thunder Bay Ontario

Numbers and types of platforms: (a) deployed current year: 5

(b) planned next year: 0

Estimated number of PTT-years: (a) current year: 0.5

(b) next year: 0

V. Agency or programme: Ontario Ministry of Natural Resources (3219)

Purpose of programme: Tracking of adult female forest dwelling woodland caribou

Numbers and types of platforms: (a) deployed current year: 6

(b) planned next year: 5

Estimated number of PTT-years: (a) current year: 0.5
0.25 time slot x 122 days (every third day) x 6 collars = 183 PTT-days
(b) next year: 0.42

W. Agency or programme: Coast Guard Environmental Response Oil Spill Tracking (2856)

Purpose of programme: Analyses of Contingency Planning Areas for currents and Response Tracking

Numbers and types of platforms: (a) deployed current year: 1

(b) planned next year: 1

Estimated number of PTT-years: (a) current year: .003

(b) next year: .003

X. Agency or programme: : Fisheries and Oceans, Institute of Ocean Sciences (2442)

Purpose of programme: Canadian contribution to Project Argo, a global array of profiling floats.

Numbers and types of platforms: (a) deployed current year: 85

(b) planned next year: 90

Estimated number of PTT-years: (a) current year: estimate 4.51

(b) next year: estimate 4.7

Y. Agency or programme: FISHERIES AND OCEANS CANADA (2376)

Purpose of programme: TO STUDY MIGRATION PATTERNS OF NORTH ATLANTIC SWORDFISH

Numbers and types of platforms: (a) deployed current year: 14

(b) planned next year: 14

Estimated number of PTT-years: (a) current year: 0.38
(14 platforms, 10 days of transmitting each = 140 platform days)

(b) next year: 0.38

Z. Agency or programme: Environment Canada , Meteorological Services of Canada / Weather and Environmental Monitoring

Purpose of programme: Buoy program (drifter and moored)

Numbers and types of platforms: (a) deployed current year: 149

Program	Total
323 Pacific Papa	77
627 Beaufort	10
633 CIS	32
693 Atlantic	3

(b) Planned next year: 116

Program	Total (estimated)
323 Pacific Papa	53
627 Beaufort	10
633 CIS	23
693 Atlantic	3

Estimated number of PTT-years: (a) current year: 27.53

(b) next year: 27.53

AA. Agency or programme: University of Alberta

Purpose of programme: Tracking of polar bears and grizzly bears

Numbers and types of platforms: (a) deployed current year: 35

(b) planned next year: 35

Estimated number of PTT-years: (a) current year: 4.2

(b) next year: 8.75

AB. Agency or programme: Fisheries and Oceans Canada, program (1142)

Purpose of programme: Tracking and dive recording of marine mammals

Numbers and types of platforms: (a) deployed current year: 16

(b) planned next year: 25

Estimated number of PTT-years: (a) current year: 3

(b) next year: 6

AC. Agency or programme: Porcupine Caribou Satellite Program (1207)
Dorothy Cooley, Government of Yukon

Purpose of programme: Document seasonal range use and timing of migration of the Porcupine Caribou Herd

Numbers and types of platforms: (a) deployed current year: 16

(b) planned next year: 15

Estimated number of PTT-years: (a) current year: 2.65

(b) next year: 2.51

AD. Agency or programme: Porcupine Caribou Satellite Back-Up Program (9207)
Dorothy Cooley, Government of Yukon

Purpose of programme: Back Up program for 1207

Numbers and types of platforms: (a) deployed current year: 1

(b) planned next year: 1

Estimated number of PTT-years: (a) current year: 0.5

(b) next year: 0.14

AE. Agency or programme: Gwich'in Renewable Resource Board (3288)

Purpose of programme: Learn about interactions, population dynamics and spatial ecology of Dall sheep (*Ovis dalli*), grizzly bears (*Ursus arctos*) and wolves (*Canis lupus*) in the Richardson Mountains, Northwest Territories.

Numbers and types of platforms:

(a) deployed current year: 13 Terrestrial animals platforms, among which 8 Telonics TGW-3580 and 5 Telonics TGW-3680.

(b) planned next year: hopefully (funding pending), we will increase our number of terrestrial platforms to 20-25.

Estimated number of PTT-years: (a) current year: 0.31

(b) next year: 1.0

AF. Agency or programme: Environment Canada (2900)

Purpose of programme: Locations of large falcons (peregrine falcons)

Numbers and types of platforms: (a) deployed current year: 10

(b) planned next year: 5

Estimated number of PTT-years: (a) current year: 0.43

(b) next year: 0.21

AG. Agency or programme: Fisheries and Oceans, Canada (788, 9788) – Marine mammal research

Purpose of programme: Marine mammals and large fish tracking, and diving data

Numbers and types of platforms: (a) deployed current year: **82 (animal)** (from Jan. to August 2006)
(b) planned next year: **40**

Estimated number of PTT-years: (a) current year: **9.8 (animal)** (Based on Jan. to August numbers, adding August nb multiplied by 4)
(b) next year: **5.0**

AH. Agency or programme: POST (3065)

Purpose of programme: Fisheries Research

Numbers and types of platforms: (a) deployed current year: 2

(b) planned next year: 2

Estimated number of PTT-years: (a) current year: 0.25

(b) next year: 0.25

AI. Agency or programme: University of Alberta – Program #3149

Purpose of programme: Tracking caribou movement

Numbers and types of platforms: (a) deployed current year: 5, terrestrial animals

(b) planned next year: 5 terrestrial animals

Estimated number of PTT-years: (a) current year: 0.36

(b) next year: 0.36

AJ. Agency or programme: University of British Columbia (3210)

Purpose of programme: Humpback whale telemetry in the Antarctic

Numbers and types of platforms: (a) deployed current year: 4 Animal (SPOT5)

(b) planned next year: zero

Estimated number of PTT-years: (a) current year: 0.109

(b) next year: 0

AK. Agency or programme: Université du Québec à Rimouski (3297)

Purpose of programme: Study of winter movements in the arctic fox

Numbers and types of platforms: (a) deployed current year:5 Argos collars PTTs

(b) planned next year: 15 Argos collars PTTs

Estimated number of PTT-years: (a) current year: 0.11

(b) next year: 0.33

AL. Agency or programme: Long Point Waterfowl and Wetlands Research Fund (3031)

Purpose of programme: Determine spring and fall migratory pathways and migration chronologies of Lesser and Greater Scaup captured on the Canadian side of the lower Great Lakes.

Numbers and types of platforms: (a) deployed current year: 20, 38g PTT-100 (implantable; Microwave Telemetry, Inc.)

(b) planned next year: 10, 38g PTT-100 (implantable; Microwave Telemetry, Inc.)

Estimated number of PTT-years: (a) current year: 1.25

(b) next year: 0.65

AM. Agency or programme: Ontario Ministry of Natural Resources (3240)

Purpose of programme: Study wolf ecology in the boreal forests of NE Ontario

Numbers and types of platforms: (a) deployed current year: 6 (Argos 4400m GPS-Argos collars)

(b) planned next year: 8 (same type as above)

Estimated number of PTT-years: (a) current year: 0.37

(b) next year: 0.5

AN. Agency or programme: Environment Canada (1706)

Purpose of programme: to track movement of sea ducks

Numbers and types of platforms: PTT 100 for sea ducks

(a) deployed current year: 20

(b) planned next year: 20

Estimated number of PTT-years: (a) current year: 1.16

(b) next year: 1.16

Special comments (if any):

Program 2019:
The SAR community, particularly in central Canada, is now using the buoy as first option when reaching the scene of a missing person in the larger fresh water lakes; however, the use of this Argos system by the SAR community in DND is expected to remain in the area of .6 PTT years.

Program 76:
Planned deployment of 6 ice drifters near PEI during Feb. 2006 cancelled due to thin ice conditions hence reduced estimate of PTT-years for 2006.

Program 3219:
I have been dealing with the ARGOS people in Maryland on a regular basis. I find them extremely helpful. One concern I have is with respect to the accuracy of data that we have to pay for. I have been keeping track of individual satellites and the accuracy of the data I receive for the 6 collars. Of the 6 satellites recording data, 3 satellites provide data of which less than 3% is within 350 m. The other 3 have over 40%. In 5 months, the accurate data points per month for all 6 collars dropped from 35% to 25%. In addition, almost 50% of the data collected is of little value for determining location. Even with a dead animal, the location accuracy varies from within 150 m to no location being obtained within the same time slot regardless of satellite. Possible reasons were provided to me and both ARGOS and Telonics assure me everything is working fine. I don't know if anyone else has looked at the data to see how much of their data is of any precision. This is not a complaint, but it was a surprise to me.

Program 2442:
One should note that floats are taking a little longer to report profiles, on average, this is because an increasing number of floats are carrying dissolved oxygen profiles.
I'm happy with the new arrangement on the JTA, it actually makes deployment of floats at sea rather more flexible. We are much less likely now to delay a launch to wait for the optimal time window for starting the electronics. I am also extremely happy with the level of service I get from CLS. I have on occasion run into problems and the most recent example was because of stupidity on my part. They leaned over backwards to help me correct the problem and I appreciate that very much indeed.

Program 1142:
This is animal research. Predicting use is rendered difficult because PTT attachment may fail or PTT may become damaged. Also, number of uplinks depends on animal dive behaviour.

Program 1207, 9207:
Regarding the time slots; some consideration for platforms already deployed would be nice – a grandfather clause so to speak. When we ordered and configured collars (some of which could be deployed for 7 years), we did not consider time of day other than making sure transmissions did not go over midnight GMT. Any new platforms we deploy will of course be programmed with the time slots in mind however we cannot afford to recapture the caribou to refurbish currently deployed collars to transmit within time slots.
The single bill received from CLS (as opposed to 1 from CLS and 1 from DFO) is convenient.

Canadian ROC's Comments:
Polling of users is incomplete because of difficulties in getting a full response from users (only 43 of the 77 programs reported), therefore the 2006 estimate is based on the usage report provided by CLS America. The number of PTT-years used through August 2006 is reported as 93.75, extrapolating to the end of the year gives an estimate of 125 for 2006. The returned reports estimate an increase of 12% for 2007 so it is reasonable to assume that the level of activity for 2007 will be about 140 PTT-years, dominated by animal trackers.

2006 saw the implementation of a new rate structure and billing system for Canadian users. Some users saw significant decreases in their bills. Other users, mostly the animal trackers and those using the limited service option in previous years, saw significant increases. Users with large increases were offered some relief by CLS in the form of a soft landing fee to somewhat mitigate the impact. This assistance was offered only for this year as a transition until the transmitters could be re-programmed to take advantage of the 1/4 day time slots. Unfortunately some collars programmed before 2006 have a transmission life of up to seven years so special

consideration should be made for these users by extending the soft landing fee for the duration of these collars.

The table below, listing the total PTT-days and costs for each family, was produced from the CLS America usage report through August 2006.. It clearly shows the rate discrepancy between the Time Slot and Full Time services. The drifters pay less of the total cost compared to the amount of time they use while the reverse is true for the animal trackers, with the exception of the Marine Animal group who had the benefit of the soft landing fee. This differential between percentage used and percentage payed should be reviewed at JTA-26.

Service	Family	PTT Days through August 2006	Total Cost	% total time	% total cost
TSLP	Land Animal	17203.75	$247,698.90	50.28	58.32
TS	Land Animal	170.75	$4,004.10	0.50	0.94
TSLP	Bird	3356.5	$53,328.60	9.81	12.56
TSLP	Marine Animal	4032.75	$26,717.85	11.79	6.29
TSLP	Fish	239.75	$3,294.00	0.70	0.78
TS	Sub Float	1232.75	$24,869.70	3.60	5.86
FT	Drifter	7689	$62,146.80	22.47	14.63
FT	Moored Buoy	242	$2,120.40	0.71	0.50
FT	UNDW_STAT	3	$57.60	0.01	0.01
FT	UNDW_VEH	47	$464.40	0.14	0.11
TOTAL	**ALL**	**34217.25**	**$424,702.35**		

Country: France

Year: 2007

A. Météo-France

Estimated PTT-years in 2007 : **87**

Purpose of programme :

Météo-France has been operating drifting and moored buoys for many years as for operational aims as in the frame of oceanographic campaigns. The drifting buoy component for the North Atlantic Ocean has been fully integrated within E-SURFMAR in 2006, all the Argos communication costs will be funded by E-SURFMAR within the allocated budget. Beside the buoy activities, Meteo-France uses a very simple, mini, shipborne meteorological station equipped with an Argos transmitter.
Observations are collected and sent in real time on the GTS (Global Telecommunication System of WMO).

Number and type of platforms :

(a) operating current year (2006) :

7

Prog.	*PTT-years*	*Type of platform*
0044	6.0	Drifting buoys (research)
0435	8.0	Shipborne AWS (operational)
9435	60.0	SVP-Baro drifters (research and operational)
0115	6.0	Moored buoys (operational)
1450	3.0	Waverider buoys in French West Indies (operational)

(b) planned next year (2007) :

8

Prog.	*PTT-years*	*Type of platform*
0044	4.0	Drifting buoys (research)
0435	9.0	Shipborne AWS (operational)
9435	65.0	SVP-Baro drifters (operational)
0115	6.0	Moored buoys (operational)
1450	3.0	Waverider buoys in French West Indies (operational)

Estimated number of PTT-years :

(a) 2006: 83

(b) 2007: 87

Country: The Netherlands

Year: 2006

A. Agency or programme: Institute for Marine and Atmospheric Research (IMAU)

Purpose of programme: Land ice change and sea level change monitoring (1238)

As a contribution to the European Project on Ice Coring in Antarctica (EPICA) IMAU has installed at one time a maximum of eight Automatic Weather Stations (AWS) in Dronning Maud Land, Antarctica. Three are currently operational. These AWSs were installed on a transect ranging from the coast to the plateau Amundsenisen, along the Swedish research stations Wasa and Svea.. The goal of this project is to extend the knowledge of the climatological conditions of this particular part of Antarctica and to obtain a better understanding of the surface energy and mass balance of the Antarctic ice sheet. Therefore surface and subsurface (bore holes up to 600 meters) temperatures, relative humidity, wind speed and direction, snow height, air pressure, short and long wave incoming and outgoing radiation is measured. Together with GPS positioning the data are transmitted as two hour averaged values through the ARGOS system. See for more information: http://www.phys.uu.nl/~wwwimau/research/ice_climate/aws/aws_ antarctica.html

Numbers and types of platforms:	(a)	deployed current year:	--
	(b)	planned next year:	1
Estimated number of PTT-years:	(a)	current year:	2.7
	(b)	next year:	3.5

B. Agency or programme ALTERRA, Dept. of Aquatic Ecology

Purpose of programme: Seals Feeding (1877)

The harbour seal population in the Dutch Wadden Sea has increased exponentially over the past 10 years. Mainly because of the difficulty of obtaining information, very little is known about the diet of these animals, let alone the potential effect this population growth has on the (commercial) fish stocks. This project, which is commissioned by the Ministry of Agriculture, Nature Management and Fisheries of the Netherlands, is designed to obtain data on possible feeding locations of the seals and on the fish species present in these seas.

To achieve this, 8 harbour seals were equipped with satellite tags in 2004 to determine their location and data on diving. Concurrently, fish will be sampled in the areas where seals are located and assumed to feed (based on the diving data). This will yield a first insight in possible dietary preference, and mostly in preferred feeding locations. In addition to this, several ways directed the diet of the seals will be explored.

Number and types of platforms:	(a)	deployed current year:	6 Telonics ST-16 PTTs
	(b)	planned next year:	6 Telonics ST-16 PTTs
Estimated number of PTT-years:	(a)	current year:	0.4
	(b)	next year:	0.4

C Agency or programme: Royal Netherlands Meteorological Institute, Scientific Department
Dutch Argo (2936)

Purpose of programme: Contribution to the ARGO programme.

Numbers and types of platforms:	(a)	deployed current year:	4 SEIMAC tx
	(b)	planned next year:	4 SEIMAC tx
Estimated number of PTT-years:	(a)	current year:	0.07
	(b)	next year:	0.13

Country: United Kingdom

Year: 2006/7

Organisation	Purpose of programme	Platforms deployed in 2006	Platforms planned for 2007	Estimated PTT-yr usage for 2007
British Antarctic Survey	Seabird tracking	31 Microwave 30g	4 Microwave 30g	0.4
	Mooring monitoring	3 emergency beacons	3 emergency beacons	0.01
	Ice shelf studies	1 fixed station	3 fixed stations	3
	Sea mammal and penguin tracking	14 Kiwisat 101 1 Telonics ST18 4 Telonics ST10 4 Wildlife SPOT 3 3 SMRU	15 Kiwisat 101 1 Telonics ST18 4 Telonics ST10 4 Wildlife SPOT 3 0 SMRU	3.7
Falklands Conservation	Penguin tracking	5 Kiwisat 101 3 Kiwisat 202	7 Kiwisat 202	0.5
	Albatross tracking	3 Microwave 30g 1 Northstar 30g	3 Microwave 30g 1 Northstar 30g	1.0
Met Office	Moored buoy network	10 (includes 2 operated jointly with Météo France, 1 within E-SURFMAR)	9 (includes 2 operated jointly with Météo France, 1 within E-SURFMAR)	5.5 (Meteo-France are responsible for Argos usage on the 2 jointly operated buoys)
	Drifting buoy network	5 SVP-B drifters in Southern Ocean 1 IcexAir buoy in Arctic (deployed in 1999) operated during summer 2006	5 SVP-B buoys	5
	Argo float programme	90 Argo floats operating	~95 Argo floats operating	5*
	AWS	6 Minos AWS	Another 5 Minos AWS	9.5
National Oceanographic Centre, Southampton	Oceanographic research	4 drifting sediment traps 4 drifting floats 1 AUV 10 watchdogs 3 gliders	4 drifting sediment traps 1 AUV 10 watchdogs 3 gliders	1.5
	MERSEA		Multidisciplinary mooring	1
Natural Research	Golden eagle tracking	4	4	1.5
Plymouth Marine Laboratory	Tracer patch monitoring	1 GPS/Argos drifter	1 GPS/Argos drifter	0.1
Royal Society for the Protection of Birds	Bird tracking	3 tags	10 tags	3
Scottish Association for Marine Science	Sea ice research	4 SVP-Bs (no drogues)	2 SVP-Bs (no drogues)	1
	Mooring monitoring	1	1	0.1
Sea Mammal Research Unit	Sea mammal tracking	~60 tags	~60 tags	10
University of Exeter	Turtle tracking	15 tags	15 tags	2.5
University of Wales	Turtle tracking	9 SMRU tags 1 Telonics	Not known	0.5

*based on 10 day cycle and an average of just over 2 time slots (0.53 day units) per transmission – not adjusted for data volume/workload.

ANNEX XIV

ACTION SHEET ON DECISIONS OF JTA-XXVI

Ref.	Subject	Action proposed	Resp.	Target date	Comments
general	**Finalization of the report**	1. Insert editorial changes & polish the text	Sec (with chair)	ASAP after each meeting	done
		2. Insert substantive changes (if absolutely needed) & take responsibility for them	Chair (with Sec)	ASAP after each meeting	done (nil)
Para 2.2	**Argos next**	Finalize requirements for next Argos instrument generation	Participants	2007	
para. 3.4	**Transmitters with solar panels**	Programme the PTTs for the expected duration of the experiment	Users & manufacturers	continuous	
para. 3.5	**Reports on the Global Agreement**	Introduce a new "country" named Europe	CLS	all reports	
para. 5.2	**LUTs**	1. Introduce within the current table of LUTs a column "Operation %"	CLS	all reports	
		2. Maintain nominal functioning of the link between the two LUTs in Réunion Island	Météo-France, IRD & CLS	continuous	
		3. Try & receive the data from NOAA-12 & -14	Météo-France, IRD & CLS	ASAP	
		4. Explore why there is no data from the Hyderabad LUT & take necessary measures	CLS	ASAP JTA-XXVII	
para. 5.3	**Blind orbit**	Use the MetOp IT infrastructure in NOAA/Suitland Md	NOAA Mr. O'Connors	ASAP	
para. 5.4	**NOAA ground stations**	Determine their capacity of receiving additional real time data sets & report back to the Meeting	Mr. O'Connors	ASAP, JTA-XXVII	
para. 6.3	**Soft landings**	Maintain exceptionally the *status quo* during 2007	CLS	2007	
para. 6.4 (i)	**Unused ID numbers**	Maintain the charge for unused ID numbers	CLS	2007	

Ref.	Subject	Action proposed	Resp.	Target date	Comments
para. 6.4 (ii)	**Incentive for frequency spreading**	Continue users education, design web pages for manufacturers & undertake dedicated studies upon request	CLS	continuous, ASAP	
para; 6.4 (iv)	**Downlink tariff & high data rate channel policy**	1. Submit a detailed, comprehensive proposal for discussion	CLS	before JTA-XXVII	
		2. Grant free access to those new services for a one-year period	CLS	all 2007	
para. 6.4 (v)	**Iridium data**	Study the feasibility of integrating Iridium data set directly in the Argos data base	CLS	During intersessional period	
para. 6.16	**Animal tracking**	Conduct a study & simulations on possible tariff adjustment(s)	CLS, animal trackers, D. Meldrum	by March 2007	
Para 6.20	**Time Slot Application**	Apply time slots to all categories	CLS	1 January 2007	
para. 6.21 & 22	**Reporting by CLS**	1. Provide report on costs to be attributed to the JTA, with analysis on previous year and projection to the current year	CLS	15 September each year	
		2. Make available some details of the JTA and non-JTA activities in terms of active IDs and revenue	CLS	each JTA meeting	
item 7, annex X	**Official information of Members / /Member States**	Circulate the Terms and Conditions under JCL to all Members/Member States (cc to ROCs & ROs)	Sec	yearly ASAP after the meeting	
para. 8.3 & 5.5	**JTA history & achievements**	1. Complete the documents by a review of the relationships between OPSCOM & the JTA	Mr. O'Connor, chair	ASAP	
		2. Maintain relevant documents "dynamic"	Chair, Sec	ASAP, continuous	
para. 8.4, annex XII	**JTA review mechanism (Jrev)**	Run Jrev according to agreed upon terms of reference, membership & modus operandi	Chair, Jrev members	Continuous	
para. 10.3	**Vice-chair**	Remind participants they might apply to the position	Sec (JCL inv. to JTA-XXVII)	May 2007	
para. 11.1	**JTA-XXVII**	Arrange for hosting & prepare for JTA-XXVII	Joint Sec.	ASAP, May 2007, continuous	

ANNEX XV

LIST OF RESPONSIBLE ORGANIZATIONS FOR A COUNTRY (ROCs) FOR ARGOS

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ANNEX XVI

NAT LIST OF ACRONYMS AND OTHER ABBREVIATIONS

ADS	Automatic Distribution System
BUFR	Binary Universal Form for Representation of Meteorological Data
BUOY	Report for Buoy Observations
CLS	Collecte Localisation Satellites
CNES	Centre National d`ètudes spatiales (France)
DBCP	Data Buoy Cooperation Panel (WMO-IOC)
ESPC	NOAA Environmental Satellite Processing Centre (USA)
FRGPC	French Argos Global Processing Centre
GAC	Global Area Coverage
GIS	Geographic Information System
GTS	Global Telecommunication System (WMO)
IABP	International Arctic Buoy Programme
IBPIO	International Buoy Programme for the Indian Ocean
IMB	Ice Mass Buoy
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IRD	Instituit francais de recherche scientifique pour le dévelpment en coopération (ex ORSTOM)
ISABP	International South Atlantic Buoy Programme
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM Observing Platform Support Centre
Jrev	permanent JTA review mechanism
JTA	Argos Joint Tariff Agreement
LAC	Local Area Coverage
LUS	Limited Use Service (Argos)
LUT	Local User Terminal (Argos)
NESDIS	NOAA Satellites and Information Service
NOAA	National Oceanographic and Atmospheric Administration (USA)
NPDBAP	North Pacific Data Buoy Advisory Panel
NPOESS	National Polar Orbiting Environmental Satellite (USA)
NWP	Numerical Weather Prediction
OCO	NOAA Office of Climate Observation (USA)
POES	Polar-orbiting Operational Environmental Satellite
PTT	Platform Transmitter Terminal (JTA)
QC	Quality Control
RO	Responsible Organization representing an agreed set of Argos User programs (JTA)
ROC	Responsible Organization representing a country or a group of countries (JTA)
SOOP	Ship-of-Opportunity Programme
SOOPIP	JCOMM Ship-of-Opportunity Programme Implementation Panel
SOT	Ship Observations Team (JCOMM)
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
VOS	Voluntary Observing Ship
WMO	World Meteorological Organization