INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

WORLD METEOROLOGICAL ORGANIZATION

ARGOS JOINT TARIFF AGREEMENT

TWENTY-SEVENTH MEETING

Jeju, Republic of Korea, 22-24 October 2007

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 Its Chairperson, Mr Yves Tréglos, opened the twenty-seventh meeting on the Argos Joint Tariff Agreement at 0900 on Monday, 22 October 2007, in the conference room of Jeju Grand Hotel, Jeju, Republic of Korea. Mr Tréglos welcomed the participants to the meeting, and expressed his thanks to Mr Yeong-Jin Yeon, Director General of the National Oceanographic Research Institute (NORI) of the Ministry of Maritime Affairs and Fisheries for providing thoughtful facilities' 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 representative of Canada, Mr Joseph Linguanti, proposed to discuss the billing of the time slot. The meeting agreed to discuss this issue under agenda item 6.

1.2.2 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 Joint Secretariat introduced the documentation.

2. REPORT OF THE CHAIR OF THE JTA

2.1 The Chairperson presented a report on his activities in support of the participants in the JTA since the previous meeting (JTA-XXVI, La Jolla, 23-25 October 2006). As foreseen at JTA-XXVI, a first task falling on the Chairperson was to complete the documents prepared on JTA history and achievements by a review of the relationships between the Argos Operations Committee (OPSCOM) and the JTA. For various reasons, this work took more time than initially foreseen and it was now only 95% complete.

2.2 JTA-XXVI had further required that the afore-mentioned documents on JTA history and achievements "be maintained as a dynamic document". The Chairperson, with the assistance of Hester Viola (whom he thanked for the efficient collaboration), took the necessary steps to have those documents posted on the JCOMM *in situ* Observing Platform Support Centre (JCOMMOPS) website. In addition, to facilitate future communications amongst the JTA community, he arranged with JCOMMOPS to establish a JTA mailing list (jta@cls.fr).

2.3. Due to personal constraints, the Chairperson was unable to attend the 41st Argos Operations Committee meeting in St Jean-de-Luz, from 5-6 June 2007. He nevertheless prepared a report on JTA activities and requested Bill Woodward, President and Chief Executive Officer of CLS America, who kindly accepted, to present the report on his behalf at the meting.

2.4. The Chairperson participated in the work undertaken by the Chairperson of the DBCP and the Joint Secretariat on the future of the DBCP and the JTA in terms of meetings and *modus operandi*. This question will be dealt with in detail under agenda item 8.

2.5. The Chairperson visited CLS in Toulouse on 17 September 2007, to assess

(i) how JTA-XXVI decisions had been implemented
(ii) the state of preparation of JTA-XXVII from the CLS point of view. Discussion mainly dealt with the problem raised by animal trackers and ways and means of solving it without imposing an unacceptable burden on CLS finances. This question would be dealt with under agenda item 6. The Chairperson and CLS had further some exchanges of views regarding the future of the JTA and a possible collaboration with Iridium (item 8).

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

2.7 Bill Woodward reported that he had presented a report on behalf of the JTA Chairperson at the 41st Session of the OPSCOM, St Jean de Luz, June 2007, where he highlighted the necessity of finding long-term solutions to the problems of some animal trackers and related soft landing issues. He presented the efforts of the JTA to document its history, and informed the Committee that the JTA had proposed to introduce an unpaid vice-Chairperson position. The OPSCOM noted the JTA-26 Session report and related agreement, and the developments related to the soft landing issue.

2.8 The JTA noted with appreciation the draft report prepared by the Chairperson regarding "OPSCOM and the JTA". The meeting thanked the JTA Chairperson for this contribution. The Chairperson explained that he required assistance from JTA Members in order to complete the document. Chris O'Connnors offered to assist in this regard (**action, C. O'Connors & JTA Chair**).

3. REPORT ON THE 2007 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 CLS, reported that a final 2951.7 PTT-years are expected to be eventually consumed in 2007, made up as follows (extrapolation for 2007 based on January-August actual consumption).

COUNTRY	Actual 2006 PTT.years[1]	Extrapolated 2007 PTT.years[1]
AUSTRALIA	81.3	85.0
AUSTRIA	0.1	0.3
BRAZIL	7.2	2.3
CANADA	143.1	182.2
CHILE	1.7	3.1
CHINA	2.9	3.5
DENMARK	23.7	21.2
EUROPE[2]		52.6
FINLAND	2.6	1.4

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

FRANCE[2]	196.8	106.9
GERMANY	28.9	54.7
INDIA	19.2	24.0
ITALY	13.4	24.1
KOREA, REPUBLIC OF	6.9	13.8
NETHERLANDS	9.7	9.5
NEW ZEALAND	11.5	12.1
NORWAY	27.5	19.9
SOUTH AFRICA	22.1	14.9
SPAIN	20.0	36.0
SWEDEN	1.8	3.0
SWITZERLAND[3]		1.7
UNITED ARAB EMIRATES	19.6	28.0
UNITED KINGDOM	75.4	59.9
UNITED STATES	2488.7	2191.3
OTHER	0.1	0.4
Total	**3404.4**	**2951.7**

3.3 The Meeting recalled that transmissions from inactive platforms were no longer charged since 2004. The meeting noted that the number of IDs in Inactive status was now between 350 and 400. The PTT.year consumption was around 250. More than 350 ID numbers had been transferred from US programs to a recycling program (out of JTA) and were still transmitting. These PTTs were increasing the system occupancy for no use. The Meeting recommended that users and manufacturers consider programming their PTTs for the duration of the experiment in order to avoid such problems (**recommendation**).

3.4 The meeting noted that all categories, except "Fish" within "animals", appeared stable on average, and that the monthly averaged time-slot ratio (i.e. number of day units divided by the number of transmission days in the month) for Marine animals was lower than last year (0.55 instead of 0.60). For buoys and for fixed stations categories, the time-slot ratio was always higher than 90%. The meeting agreed that the actual time slot usage was eventually consistent with the time slot simulations.

3.5 The meeting recalled that inactive service was linked to system occupancy in general. CLS reported that it had a tool available for measuring system occupancy as a function of geographical location and time. The meeting agreed that it was better to operate a system where active PTTs are “competing” against each other rather than against inactive ones.

3.6 The Meeting recalled the decision by JTA-XXV that the Surface Marine programme of the Network of European Meteorological Services, EUMETNET (E-SURFMAR) should appear separately in the CLS report, instead of being merged within one particular country. CLS had agreed to introduce a new “country”, named “EUROPE”, in the reports to the next meetings.

3.7 Detailed information on the 2007 Global Agreement is given in ***Annex III***.

4. REPORT ON THE DEVELOPMENT OF CLS

4.1 The reports on 2006-2007 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 ***Annex IV*** *and* ***Annex V***, respectively.

4.2 The meeting recalled that one of the requirements of the Argos 3 Ground Segment project (SSA3) which started in 2003 was to provide for Argos PTT/PMT test bench. This facility is

2: E-SURFMAR program was attached to "FRANCE" in 2006 and is attached to "EUROPE" in 2007.
3: Switzerland joined JTA in 2007

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 the French Centre National d'Etudes Spatiales (CNES) and has been nominally used for certification since September 2005. CLS reported that the Test Bench, funded by CNES, has then been moved to CLS.

4.3 CLS reported that only a small portion of the 80 PMTs initially built to test the Argos 3 downlink had been delivered to users because of the delays in getting the METOP Argos 3 system operational. Tens of new generation prototypes would be replacing the 80 PMTs by the beginning of 2008. The meeting recommended that CLS have this pilot activity implemented as soon as possible (**action, CLS**). The meeting also recommended that Argos users who need that kind of capability should start using the demonstration PMTs as soon as they become available and that the ROCs should promote the pilot activity at the national level (**action, ROCs & users**).

4.4 Regarding the connection of the Falklands/Malvinas LUT to the Argos System, CLS reported that the final link between the LUT and the UK MetOffice was to have an operational communication link but that the actual status of the link was not known at present. The meeting agreed that other antennas in the South Atlantic region could assure adequate coverage for the region and that this requirement could be deleted from the list of JTA requirements. The status of the Saint Hellens LUT has not changed.

5. REVIEW OF USER'S REQUIREMENTS

5.1 The Meeting noted a report from the Chairperson of the DBCP on the main results of the twenty-third session of the Panel, which had taken place in Jeju from 15 to 19 October 2007. These included in particular the following specific recommendations to the JTA:

1. Efforts should continue to effectively identify and minimise delays affecting the timely distribution of data inserted by CLS on to the Global Telecommunication System (GTS), i.e. (i) filling the gaps in global coverage by the regional network, including the South Atlantic Ocean, the South-East Pacific Ocean, and the Indian Ocean; (ii) upgrading the data processing system to be more reliable; (iii) developing appropriate monitoring tools to improve responsiveness to problems;

2. CLS to take action with the fishing fleets they monitor and provide them with information leaflet on data buoy vandalism;

3. JTA to note the decision by the DBCP to restructure its activities and consider how this could impact the JTA activities;

4. Address the impact of the Iridium Pilot Project; there may be a move in the community to increase the use of iridium which may impact the Argos charging and therefore the negotiations;

5. Maintaining the present arrangements for the funding of the independent JTA chair;

6. Establishing new arrangements for the JTA to contribute to the DBCP trust fund in order to cover the cost of Panel Members undertaking activities on behalf of the JTA;

7. To make PMTs available to the community for evaluation purposes;

8. The JTA should recommend that the Argos Operations Committee review the MOU between NOAA, CNES, and EUMETSAT so as to permit fair competition by other satellite data service providers by opening up free and open use of the global Argos datasets that were currently only distributed to CLS.

5.2 Regarding item 1 above (delays), the meeting noted that the current developments of CLS with the GTS data processing (Argos 2001-P3B) should improve in principle, the data timeliness. The meeting also noted that the development of the Argos ground receiving stations could potentially improve the situation but agreed that any new antenna installation should be made METOP compatible. Such antennas are more expensive than Argos2 compatible antennas so installing any new station will have cost implications for the JTA. The meeting noted that no specific efforts were planned by EUMETSAT to upgrade the existing sites for METOP. The meeting agreed to bring this technical issue to the attention of the next OPSCOM meeting (**action, CLS**). The meeting agreed that the list of the new antennas to be installed had to be prioritized in order to plan for their implementation and optimize the expenses. It regarded the South Atlantic, the Indian Ocean, and the South-West Pacific Ocean as priority areas for installing new antennas (**action, CLS**). The meeting also noted that while addressing the blind orbit issue, CLS might also offer solutions for improving data timeliness. The meeting noted with appreciation that CLS had developed or was in the process of developing data timeliness monitoring tools. It asked CLS to report in this regard at the next JTA Session (**action, CLS**).

5.3 Regarding item 2 above (vandalism on data buoys), the meeting agreed that CLS could play a useful role in this regard. It invited CLS to print and distribute the vandalism leaflets in appropriate languages to the fishing industry or fishing authorities it is dealing with (**action, CLS**). These leaflets are presently available in PDF format and in four languages: French, English, Spanish, and Russian. The meeting noted with appreciation the offer from the KMA to translate the leaflet in Korean (**action, KMA**).The DBCP Chairperson offered to invite DBCP Members for translating the leaflet in other languages as required (**action, DBCP**). The meeting asked CLS to provide the WMO and IOC Secretariats with the list of countries using Service Argos for fishing vessel-monitoring (**action, CLS**).

5.4 Regarding item 3 above (DBCP restructuring), the meeting will be addressing the issue under agenda item 8.

5.5 Regarding item 4 above (impact of Iridium), the meeting noted that CLS would have to consider this matter in due course, and that the consequences of the increased use of Iridium on the cost recovery model, and the tariff structure would depend on future scenarios.

5.6 Regarding item 5 above (arrangements for the independent Chairperson), the meeting agreed to continue with the current arrangements. CLS shall therefore continue to support the work of the JTA chair by means of a transfer from its JTA income as a contribution to the DBCP trust fund. The estimated cost for the JTA will be USD 15,000 (**action, CLS**).

5.7 Regarding item 6 above (covering DBCP Members having activities on behalf of the JTA), the meeting agreed that the JTA could provide a limited funding (e.g. some USD 2500), and requested CLS to consider making a contribution to the DBCP trust fund in this regard (**action, CLS**).

5.8 Regarding item 7 above (making PMTs available), CLS indicated that it would reactivate its offer with new generation PMTs (**action, CLS**).

5.9 Regarding item 8 above (opening free access to Argos datasets), the meeting agreed that the issue of providing datasets on a free and unrestricted basis should be submitted to the OPSCOM. The meeting asked the JTA Chairperson to write to the OPSCOM co-chairpersons in order for OPSCOM to consider the issue (**action, JTA chairperson, before next OPSCOM**). Nevertheless, the OPSCOM representative, Mr Chris O'Connors explained that the MOU between NOAA, CNES, and EUMETSAT specifically restricted access to such data (para 8.4) in order not to disadvantage operations of the Argos system by CLS.

5.10 With regard to the specific user requirements raised at previous JTA Sessions, the Meeting noted the following actions or considerations:

(i) Blind Orbit Support

The meeting noted that stored data collected from the NOAA satellites are done at Fairbanks Alaska and Wallops Island Virginia Command Data Acquisition (CDA) ground stations. The spacing of these two ground stations does not allow all satellite passes to be collected in a day. The satellite recorder will collect multiple passes usually twice a day prior to being able to download its data at the ground sites. These missed orbits are called blind orbits. Currently the Initial Joint Polar Agreement between EUMETSAT and NOAA covers the collection of blind orbit data starting with NOAA-18 and MetOp-A at a third ground station operated by EUMETSAT at Svalbard Norway. Between the three ground stations, all orbits in a day can be collected resulting in timely data availability. All future IJPS satellites will benefit from data collection from the three CDA stations. NOAA satellites launched prior to the beginning of the IJPS agreement NOAA 15, 16, and 17 are not eligible for collection at the EUMETSAT Svalbard ground station.

In preparation for the next generation of NOAA polar satellites called NPOESS, a new ground station was installed in Svalbard. This station is not currently in use, but could be used to collect stored data from NOAA satellites not covered by the IJPS agreement. NOAA has tested this capability and shown that the Svalbard equipment can successfully collect stored orbits, but the process requires the use of hardware used at NOAA for supporting the MetOp-A data collection. To protect the implementation of the MetOp-A data it was decided by NOAA to hold off on the NPOESS Svalbard data collection until after MetOp-A was declared operational. Based on the latest information available NOAA expects blind orbit collection to start for the non-IJPS satellites by the end of 2007.

(ii) Ground station action

Chris O'Connors reported on the issue as requested at the last JTA Session. Current direct readout broadcast ground stations collecting NOAA satellites real time data on the High Rate Picture Transmission (HRPT) data stream cannot process MetOp-A direct broadcasts. The new MetOp-A satellite introduces a new digital version of HRPT called Advanced High Rate Picture Transmission (AHRPT). Current ground stations are required to upgrade their software and some hardware components to handle the new digital data broadcast. NOAA, CNES, and CLS have worked closely together to identify key sites to maintain a high level of real time service (see CLS operations report).

In preparation for the next generation of NOAA polar satellites called NPOESS, the ground stations will again require an upgrade to handle the Low Data Rate (LRD) transmission. CLS with the OPSCOM will need to consider whether further upgrades to the real time network beyond MetOp is necessary. NOAA proposed NPOESS stored data ground system network may contain 15 sites around the world, which will allow 30 minutes or less recovery of data. NOAA's NPOESS contractor may phase this ground system into to operation by the launch of the second NPOESS satellite in 2016. If the system is implemented as intended, it may not be necessary to continue with LRD updates.

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

See paragraph 5.2

(iv) Indication of the percentage of time an LUT is operational:

The meeting noted with appreciation that CLS had developed a tool for indicating the percentage of days the data are being received on a monthly averaged basis for each of the local receiving stations for the Argos network. CLS reported that the tool was incomplete and would be developing it further to indicate additional information such as what operational satellites are being received via each station (**action, CLS**).

(v) Brazilian satellites

CLS reported that processing the data from the Brazilian equatorial satellites (SCD-1, and SCD-2) was technically possible with no required additional developments. CLS was receiving datasets from two satellites with limited equatorial coverage (i.e. footprint while satellite flies over Brazil), and was processing the data from those satellites. However, the meeting noted that no progress had been made with regard to an agreement between CLS and INPE. The meeting asked CLS to make available the data from the Brazilian satellites via the new Argos data processing system (**action, CLS**).

Other requirements

5.11 The meeting considered the following additional requirements:

(v) Requirement for time slot applications:

The meeting agreed to address this issue under agenda item 6.

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 Bill Woodward, on behalf of Mr Christophe Vassal with details of the finalized Argos operating costs for 2006. These are given in ***Annex VI***.

6.2 The Meeting acknowledged the information given, and noted the final 2006 total Argos Basic Cost figures of 6,656 K€ for personnel-related expenses, 4,972 K€ for other expenses, and 613 K€ for amortization, for 12,241 K€. It further noted with appreciation the detailed breakdown of such costs for 2006, as well as the evolution of these figures over previous years, presented for comparison. Mr Woodward noted that, for the year 2006, the costs attributed to the JTA, computed according to the methodology developed by CLS since 4 years now, was 6,380 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 were heavily impacted by the new tariff scheme. It was recognized that there was great difference between those who were benefiting from the soft landing and others.

6.4 The Meeting recognized that the non-JTA incomes increased significantly in 2006. In terms of the balance for JTA, with new global tariff scheme and the US large programme arrangement agreed in JTA-26 to accommodate large programmes consuming more than 1200 ptt -years., it was expected that JTA might cover its costs by 2007.

6.5 The Meeting noted that the cost to be attributed to the JTA was based on the percentage of JTA active PTTs to the total active PTTs within the science applications (JTA represented 91.5% for 2006).

6.6 With regard to the specific action items identified by previous meetings, the Meeting noted and agreed as following:

(i.) *Soft landing*: The Meeting recalled the agreement in JTA-26 to continue to provide the “soft landings” to several marine animal programs through 2007, with the clear understanding that all programmes would move towards the agreed tariff structure over the course of the following years. It was indeed recognized that there was great difference between those who were benefiting from the soft landing and others. The meeting noted that this arrangement would cease as from 1 January 2008.

(ii.) *Unused ID numbers and 28 bit IDs*: (see summary report of JTA-XVIII, paragraph 6.2). The Meeting noted that 22,614 ID numbers out of 29,892 IDs (about 76%) were 28 bit, therefore that the situation had improved from last year (about 69%). In line with its previous year's decision, **the Meeting agreed that those unused IDs charges should be maintained.** To improve recovering the ID numbers, it was suggested implement a minor ID charge for all IDs in a program. The advantages foreseen were that (a) this is an incentive for the user to manage efficiently, his IDs *during the lifetime of their program, and (b) the ID invoice acts as a swift reminder to the owner of a stopped program to release the IDs.* It was noted at the meeting some users were being charged an unused ID fee for PTTs deployed, but silent, or in storage awaiting deployment. The meeting recalled that unused ID fee was not to penalize users whose IDs are in use, but to recover these for redistribution. After discussion, **the meeting agreed, in principle, that PTTs that have not transmitted during a period of 24 months would be charged 3.85 € per month from the 25th month until the ID numbers are returned to CLS/Service Argos.** The purpose of this fee is to recover IDs no longer required. The Meeting considered that this should be negotiated and decided together with new definition of the ROC roles (see also item 8). CLS will study new scenarios regarding unused IDs (**action, CLS**).

(iii.) *Incentive for spreading frequency*: 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. 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. The new ArgosWeb site has been implemented since September 2006. Web pages dedicated to manufacturers have been designed. They include specific documentation and frequency distribution display all around the world. Further to the signature of a dedicated NDA, web pages are being made available to manufacturers (Non-disclosure Agreement).

(iv.) *Downlink tariff & high data-rate channel policy*: METOP 1, which carries an Argos-3 instrument, equipped with a downlink capability and the 4.8 kbps high data- rate channel, was launched on 19th October 2006. The meeting considered to continue with the proposed Downlink Tariff Policy presented at JTA XXII, that was 1) a fixed monthly fee of possibly 20 € per active PTT, 2) 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 €. To foster the test and use of these new capabilities, CLS kept the current proposal to grant free access to these new services for a one-year period beginning 1st January 2008. **The meeting agreed to keep this arrangement.** It was also agreed that the downlink tariff should be further discussed in 2008 taking into account the status of Iridium usage and services.

(v.) *Processing for Iridium data*: In January 2007, CLS became a global Iridium VAR (Value Added Reseller) for the Iridium modems and data service. It was reported that since 2006, CLS America has been processing for GTS dissemination the Iridium data from ARGO floats deployed by the University of Washington. In parallel, CLS has developed an Iridium server and a database, which is to be linked to the Argos operational database. As pilot step, data from two Iridium drifters were being inserted in the Argos Development database and GTS processing was being tested. CLS reported that the real-time uploading of the Iridium data to GTS would be possible from April 2008. The meeting accepted with appreciation the proposal by CLS that Iridium data processing services would be provided free of charge during the DBCP Iridium pilot project (i.e. 2 years as of July 2007). The pricing structure for Iridium transmissions and service was under study: **The Meeting noted that such a study should take into account the feasibility of integrating Iridium data sets directly in the Argos database, as well as possible bundling it in the GTS processing. The meeting requested CLS to include the Iridium services into the global planning as well as a 5-Year Plan**.

(vi.) The meeting requested CLS to draft the next Five Year Plan (FYP) to be discussed at the next JTA meeting (**action, CLS).**

TARIFF ISSUES CONCERNING MARINE ANIMAL TRACKING

6.7 At its 26th meeting (La Jolla, 2006), the Meeting requested the CLS and participants from animal tracking communities to conduct a study and simulations on possible tariff adjustment based on the proposals made during the meeting. A final and definite decision was to be taken at the current Meeting.

6.8 Following this request, a study and related discussions conducted by CLS and animal tracker representatives, to introduce price capping to be applied to all animals. Detailed report by CLS with the agreement between CLS and animal tracker representatives is reproduced in ***Annex IX*** to this report.

6.9 The Meeting noted the agreement following which the current Argos monthly charge (A + B x day units, A = 15 € and B = 9 €) would be capped to a maximum of 12 day units. As consequence, the tariff would remain unchanged for all animals which produce less than 12 day units (48 x 6-hours time slots) per month and is fixed to (15 + 9 x 12) = 123 € for the others. This intended to develop science applications and encourage the biologists to use the system as much as they need, for a maximum fixed price. The Meeting noted that this would also help relax the transmitter setting constraints, which would be mainly driven by the mission itself and the battery autonomy, rather than service price considerations.

6.10 CLS noted that, considering the total balance would be positive until the end of current 5-Year Planning period (until 2009); this arrangement could be valid until 2009. It also pointed out that **this pricing would be defined for, and applied to, animal categories only**. After review, **the meeting approved this arrangement.**

TIME SLOT APPLICATION

6.11 As agreed at the JTA XXVI, the time slot accounting was extended in 2007 to all Argos platform categories. The CLS reported that because of this application its financial loss for 2006 was 109 k€ and projected to 85 k€ for 2007.

6.12 Some participants pointed out that, in some region, the current time slot scheme was not as effective in terms of cost saving as other regions. In this context, a study was suggested on the feasibility of user-tailored time slot. CLS noted that this would be technically feasible, but might add complexity to the current scheme including the database, operational counting, accounting and billing. Noting that all users should get benefit from the time slot scheme, while at the same time the tariff should remain simple, the Meeting decided to remain open to this suggestion and to discuss on the necessity of such a study in the next session in 2009.

PERIODIC REPORTING BY CLS

6.13 The Meeting recognized that there was a need for participants to obtain information on the financial status well in advance of the annual meeting. As the case in previous years, it requested CLS to provide the report on costs attributed to the JTA, with an analysis of the previous year and a projection of the current year, by 15 September of each year.

6.14 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 2008 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 2008 Agreement for all participants. Eventually, and taking into account a few editorial amendments, the Meeting agreed on the Terms and Conditions for the Agreement for 2008.

7.2 The meeting discussed whether the role of the ROC should be included in the Terms and Conditions for the 2008 agreement. The meeting agreed that the role of the ROC should not necessarily be included in the contract as this role was pre-supposed and defined in other documents.

7.3 The meeting noted that the contract was signed between CLS and the user, but not with the ROC. The Terms and Conditions agreed at the JTA meeting were the framework for that commitment and contract between the users and CLS.

7.4 Some substantial changes were introduced into the 2008 Terms and Conditions, as compared to those for 2007. The meeting substantially changed the context in which those terms and conditions were being used. For example, the JTA Chairperson recognizing that the document is reflecting the Terms and conditions agreed upon by the JTA at its 27th Session will now sign the contract. Changes, excluding editorial changes, include the following:

(i) 2007 is replaced by 2008;

(ii) Title of the section "**OBJECTIVE**" deleted and the introduction to now read "These Terms and Conditions outline costs for services to be provided by Collecte Localisation Satellites (affiliate of CNES)";

(iii) Under "**TIME PERIOD OF COVERAGE**", These Terms and Conditions are valid for the time period beginning on January 1 and ending on December 31, 2008;

(iv) Under "**DEFINITIONS**", 365 is replaced by 366;

(v) Under "**DEFINITIONS**", the "ROC" is the Representative of Country representing a country or a group of countries participating in the JTA;

(vi) Under "**DEFINITIONS**", the definition of Agreement shall be replaced by "The "Agreement" includes all those participating countries which agree to the Terms and Conditions contained herein and are listed in Annex A to this Agreement."; an Annex A providing for the List of Countries participating in the 2008 Terms and Conditions of the JTA is added;

(vii) Under "**DEFINITIONS**", Definition of the large programmes shall be added to read "those programmes that are funded and managed by a single organisation";

(viii) Under "**DEFINITIONS**", the definition of the Programme Manager is deleted;

(ix) Under "**BASIC SERVICES PROVIDED BY CLS**", References to multi-satellite service and dual processing are deleted;

(x) Under "**BASIC SERVICES PROVIDED BY CLS**", the following items are added: (4) On-line data access, and (5) GTS Processing and Distribution;

(xi) Under "**USER BASIC SERVICE CHARGES**", Coefficient B represents the PTT-day unit rate;

(xii) Under "**USER BASIC SERVICE CHARGES**", under coefficient n, the sentence "From 2007 the time slots will be applied to all platform categories" is deleted;

(xiii) Under "**USER BASIC SERVICE CHARGES**, under Animals, the paragraph shall read, "PTTs in this category are those that are used to track animals. A note is added: "Charges for Platforms in this category will be capped at n=12 Day Units per month" is added;

(xiv) Under "**USER BASIC SERVICE CHARGES**", the heading of the first column shall read "Number of platform years";

(xv) Under "**USER BASIC SERVICE CHARGES**, under Unused IDs, sentence "the purpose of this fee is to recover IDs no longer required" is added;

(xvi) Under "**ADDITIONAL SERVICES PROVIDED BY CLS AND NOT INCLUDED IN BASIC SERVICES**" (added value service replaced by additional services), paragraph rephrased to read "Additional services such as ArgosDirect (the former ADS, Databank) service, ArgosMonitor, Moored Buoy monitoring and others are provided by CLS and charged according to the yearly catalogue of prices";

(xvii) The section "**DESIGNATED ROC / RO**" is deleted;

(xviii) Under "**DISTRIBUTION OF PROCESSED DATA**", item (1) rephrased to "These Terms and Conditions do not cover the costs of special additional services made to provide the processed data back to the users. These must be made by the user directly with CLS";

(xix) Under "**BILLING AND PAYMENT**", the sentence is replaced by "CLS will send invoices on a two monthly basis (CLS America on a monthly basis) based on consumption to the organizations covered by the country agreement";

(xx) Under "**GENERAL CONDITIONS OF AGREEMENT**", item (1) rephrased to read "The designated ROC / RO and CLS jointly agree the list of users included in the Agreement and will update this list as appropriate. To assist in this process CLS will notify the ROC/RO of any new programmes that might qualify for this agreement";

(xxi) Under "**GENERAL CONDITIONS OF AGREEMENT**", item (2), value added services replaced by additional services;

(xxii) Under "**GENERAL CONDITIONS OF AGREEMENT**", Signed on behalf of the participating countries by the JTA Chairperson (i.e. replacing signed by ROC/RO or Programme Manager);

(xxiii) Section "**NORMAL TARIFFS CHARGED BY CLS**" deleted.

The Terms and Conditions for the 2008 Agreement are given in ***Annex VIII.***

8. THE FUTURE OF THE JOINT TARIFF AGREEMENT

JTA HISTORY AND ACHIVEMENTS

8.1 The meeting recalled the following action items from JTA-XXVI regarding the JTA history and its achievements: (a) chairperson and Mr O'Connor to complete the review of the relationships between OPSCOM & the JTA, and (b) the Chairperson to maintain relevant documents "dynamic" with assistance of the technical coordinator of the DBCP. The information is now available from the JCOMMOPS web site.

8.2 The meeting recalled that the report of the review group presented at JTA XXVI was made up of 4 "sheets", now made available as a dynamic document on the JCOMMOPS web site:

- **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.

JTA PERMANENT REVIEW MECHANISM (JREV)

8.3 The meeting recalled that at its 26th Session it had decided to establish "a permanent JTA review mechanism (Jrev)". The terms-of-reference, membership and modus operandi are detailed in Annex XII *of the 26th Session report.*

8.4 However, the meeting noted that the Jrev had not been active during the last intersessional period and that Jrev at this JTA Session could present no report.

ORGANIZATION OF FUTURE MEETINGS

8.5 The JTA and the DBCP Chairpersons together with the Secretariat are drafting a document proposing a future structure for running the DBCP and JTA activities. The goal was to reduce the cost of the meetings for the ROCs and the Secretariats. The latter document was presented to the DBCP 23rd Session for discussion. The DBCP made some modifications to the proposal and agreed to restructure its modus operandi as follows::

(i) to organize on the first day (Monday) a scientific and technical workshop;
(ii) to have the main Session running from Tuesday to Thursday;
(iii) to have a parallel session on Thursday morning of the DBCP Executive Board and the National reports presentation;
(iv) to have meetings in a venue to be decided by Panel Members on even years;
(v) to have meetings either in Paris or Geneva at the IOC or WMO Headquarters respectively on odd years; alternating between Paris and Geneva.

8.6 The meeting agreed to align somehow with the DBCP modus operandi, and to have its main Session on Friday, for a review of the final report on the Saturday morning. The meeting also agreed to have an informal meeting of interested JTA participants on Thursday morning while the DBCP is having its parallel Executive Board/National Reports Sessions. Finally, the meeting agreed to produce a more simple final report for the Session focussing on recommendations, agreements, and agreed action (**action, secretariat**).

JTA FUTURE ACTIVITIES AND THE ROLE OF THE ROCs

8.7 The chairperson recalled that four issues were to be considered in the discussion: (i) providing a preferential tariff, (ii) enhancements in the Argos system, (iii) the service that CLS provides to the Argos users in processing the data (i.e. end to end perspective vs. the “transmission pipe” only perspective), and (iv) the role of the OPSCOM representing the common will of NOAA and CNES and mandating CLS to provide the Argos service.

8.8 The meeting then considered that the future JTA activities depended very much on the definition of the role of the ROCs. It agreed that this role should be strong in the future and that it was going to substantially evolve as compared to previous years. A number of ideas for possible role of the ROC were considered during the session.

8.9 The meeting discussed whether a ROC representing the national interests was actually required as opposed to a JTA comprised of user group representatives. The meeting noted that the kind of solidarity established by the JTA over the years had proved efficient. At the same time, the meeting noted that the user communities were not evenly represented in different countries. The meeting also considered that the user groups, in fact, could be represented by their own ROCs who attend the JTA meetings, in their national capacities (as opposed to their organizational capacities). The ROCs are meant to transcend the different user groups. The meeting agreed that the intergovernmental nature of the JTA under the WMO and IOC umbrellas permitted to treat all countries equally. The meeting further agreed that the JTA could in fact not exist as such without the ROCs but that a clearer definition of the ROC was needed, including a minimum set of definitions. The meeting therefore decided that the national representation via the ROCs was still appropriate but that this did not prevent users to be reasonably represented at the JTA meetings, as has been the case in the past with the DBCP representing the buoy community (**agreement**).

8.10 The meeting did set up an *ad hoc* Task Team during the duration of this meeting lead by Ken Jarrott, and including, in particular Chris O'Connors (OPSCOM representative), David Meldrum (UK ROC and DBCP representative), and Philip Lovell (animal trackers representative) responsible to draft the role of the ROCs and their interaction with the JTA. The proposed role of the ROCs defined by the Task Team and eventually adopted by the meeting as a draft is provided in ***Annex VII***.

8.11 The meeting noted that the nomination of the ROCs had been informal so far. The meeting agreed that the ROCs should from now on be a "Representative of Country representing a country or a group of countries participating in the JTA" and not anymore a "Responsible Organization representing a country or a group of countries".

8.12 The meeting agreed that there should be a formal mechanism for nominating the ROCs so that their role is formally recognized. The document prepared by the *ad hoc* Task Team had proposed a mechanism but the meeting agreed that that it was premature at this point to agree on this process. One possible mechanism is to have the ROCs nominated by a responsible agency within the country and then submitted to the OPSCOM for acceptance. CLS could be seeking for that agency, then have the agency writing to CLS to inform it about its acceptance, and finally CLS to provide the list of such organizations to the Secretariat. However, the meeting considered that process as potentially complex and inefficient, and agreed to give it some additional thoughts during the intersessional period.

8.13 The meeting noted that the incentive for the ROCs to attend JTA meetings had disappeared since CLS was now billing the users directly and there was no more a possibility for the ROCs to utilize some of the national JTA income to fund their activities on behalf of the JTA. Financial constraints nationally might not allow national representation at the future JTA meetings. The meeting discussed whether other funding mechanism could be used to convince countries to continue supporting the JTA. The meeting agreed in principle that the JTA could eventually assist in providing funding for the ROCs, including for their participation at the JTA meetings, and for them to travel within the country to assist users.

8.14 However, the meeting agreed that in order for the ROCs to be independent from CLS (who runs other activities that are JTA-related) if any ROC activity should be funded to promote Argos, the funding should not come from CLS directly but from the JTA revenues, and that a proper mechanism should be proposed. The meeting noted that the arrangements established to fund the independent Chairperson, with JTA revenue transiting via CLS, had worked effectively.

8.15 The meeting noted that Service Argos was still de facto in a monopolistic situation with regard to the provision of services related to satellite data telecommunication and location for some of the large applications under the JTA (e.g. buoy programme), but that was not necessarily the case in terms of satellite raw satellite data telecommunication only (i.e. as a "transmission pipe").

8.16 The meeting thanked Ken Jarrott for leading the *ad hoc* Task Team and producing a report in good time. The meeting agreed that the document should be reviewed during the next intersessional period, and requested its chairperson to take care of the revision process (send the document to all ROCs, asking for comments, etc.). Based on those comments, the chairperson would make a synthesis to be reviewed at the next JTA Session (**action, Chairperson**).

8.17 The meeting requested that all information to the ROCs be provided via an electronic mailing list yet to be established (**action, CLS/JCOMMOPS**).

8.18 The meeting concluded the discussion on the future of the JTA and agreed that (i) the JTA was l useful for the foreseeable future, (ii) the role of the ROC was important and that the JTA should be structured around this role, (iii) the role of CLS was to provide for an integrated service, and (iv) the role of the Argos OPSCOM overseeing the operations of the Argos System from the NOAA and CNES perspective should be duly considered by the JTA.

9. FUTURE PLANS AND PROGRAMMES

9.1 Written reports on future plans and programmes for the use of the Argos System in 2007 were submitted to the meeting. Following normal practice, these reports are given in ***Annex XI***.

SUBMISSION OF A NATIONAL REPORT TO THE JTA MEETING

9.1 During the national report session, a substantial discussion took place regarding the current format of the national report. The current format's primary purpose was to forecast potential PTT use by country for operational planning by CLS. Now that ARGOS has evolved and CLS has the ability to forecast future PTT use, the ROCs proposed an alternative national report submitted 30 days prior to the start of the DBCP with the following sections.

1. Overall Summary by Country
2. User types by family (Table of PTT use by country)
3. Technological changes that affect user requirements
4. User issues, problems, and level of satisfaction with ARGOS
5. Successful program use of ARGOS (good news)
6. Analysis of local operational issues

9.2 The meeting agreed with the proposal that was made during the national report session. It therefore agreed that the ROCs should provide a national report to the JTA meeting, at least one month prior to the meeting; the content shall follow the current report guidance. The meeting asked the Secretariat to draft a new template for the national reports to be attached as an annex to this meeting's final report (***Annex X***) (**action, Secretariat**).

9.3 It was also suggested that the discussion of the national reports be conducted earlier in the JTA such that any issues could be resolved before the conclusion of the JTA.

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 5.6)

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

10.3 The Meeting recalled its decision at its 26th Session to establish the position of an unpaid Vice-Chair, as of its 27th meeting in 2007. The meeting unanimously elected Mr Frank

Grooters in that position.

11. DATE AND PLACE OF THE NEXT MEETING

11.1 In line with the agreement of the preceding twenty-third session of the Data Buoy Co-operation Panel, the Meeting welcomed the potential offer from the South African Weather Service for hosting the 28th Session of the JTA in the Republic of South Africa. Tentative dates for the session were agreed as October-November 2008, on the Friday and Saturday of the same week as the DBCP 24th Session. Awaiting for the final decision by South Africa, the Panel agreed to hold the Session in Paris or Geneva hosted by IOC or WMO respectively as an alternate choice.

12. CLOSURE OF THE MEETING

12.1 In closing the meeting, the Chair expressed his considerable gratitude to the staff members of the National Oceanographic Research Institute (NORI) of the Ministry of Maritime Affairs, particularly to Dr Yeong-Jin Yeon, Director General of NORI, and to Jung-Hyun Kim of NORI 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-seventh meeting on the Argos Joint Tariff Agreement closed at 12:20 hours on Wednesday, 24 October 2007.

ANNEX I

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ANNEX II

AGENDA

ORGANIZATION OF THE MEETING

1.1 OPENING OF THE MEETING
1.2 ADOPTION OF THE AGENDA
1.3 WORKING ARRANGEMENTS

2. REPORT OF THE CHAIRPERSON OF THE JTA

3. REPORT ON THE 2007 GLOBAL AGREEMENT

4. REPORT ON THE DEVELOPMENT OF CLS/SERVICE ARGOS

5. REVIEW OF USER'S REQUIREMENTS

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

7. TERMS AND CONDITIONS OF THE 2008 GLOBAL AGREEMENT

8. THE FUTURE OF THE JOINT TARIFF AGREEMENT

9. FUTURE PLANS AND PROGRAMMES

10. ELECTION OF THE CHAIRPERSON AND VICE-CHAIRPERSON

11. DATE AND PLACE OF THE NEXT MEETING

12. CLOSURE OF THE MEETING

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ANNEX III

REPORT ON THE 2007 AGREEMENT

1. Recall of 2006 participation

	Buoys & others		Floats	
Country	Average active PTTs/month	Total PTT.years	Average active PTTs/month	Total PTT.years
AUSTRALIA	36	25.1	111	6.2
AUSTRIA				
BRAZIL				
CANADA	53	35.8	84	5.4
CHILE	2	0.8	5	0.6
CHINA	1	0.6	18	1.6
DENMARK				
FINLAND	3	2.1		
FRANCE	219	144.1	206	19.9
GERMANY	25	11.3	127	8.9
INDIA	17	10.2	81	8.9
ITALY	4	1.5	13	1.8
KOREA, REPUBLIC OF	2	1.1	100	5.8
NETHERLANDS	1	0.1	10	0.7
NEW ZEALAND	9	7.1		
NORWAY	12	5.7	23	10.3
SOUTH AFRICA	19	17.5		
SPAIN	9	3.9	8	0.6
SWEDEN				
UNITED ARAB EMIRATES				
UNITED KINGDOM	44	26.7	105	5.8
UNITED STATES	2429	1930.4	1508	237.4
OTHER				
Total	**2884**	**2223.9**	**2398**	**314.1**

Table 1a: Average number of active PTTs per month and total PTT.years per country and per PTT category, in 2006 (First half table)

	Animals		Fixed stations	
Country	Average active PTTs/month	Total PTT.years	Average active PTTs/month	Total PTT.years
AUSTRALIA	135	30.2	21	19.8
AUSTRIA	2	0.1		
BRAZIL	28	7.2		
CANADA	770	101.9		
CHILE	8	0.3		
CHINA	5	0.8		
DENMARK	47	6.7	17	17.0
FINLAND	5	0.5		
FRANCE	44	15.4	25	17.4
GERMANY	55	8.8		
INDIA	3	0.1		
ITALY	6	1.1	10	9.0
KOREA, REPUBLIC OF	1	0.0		
NETHERLANDS	7	3.8	7	5.2
NEW ZEALAND	18	4.4		
NORWAY	31	6.5	5	4.9
SOUTH AFRICA	13	2.7	2	1.9
SPAIN	79	15.6		
SWEDEN	11	1.8		
UNITED ARAB EMIRATES	75	19.6		
UNITED KINGDOM	127	39.3	4	3.6
UNITED STATES	1960	363.0	77	69.9
OTHER	1	0.1		
Total	**3430**	**629.9**	**167**	**148.7**

Table 1b: Average number of active PTTs per month and total PTT.years per country and per PTT category, in 2006 (Second half table)

	Average active PTTs/month	Total PTT.years
All countries	**8879**	**3316.5**

Table 1c: Average number of active PTTs per month and total PTT.years all countries and all categories, in 2006

2. Report on 2007

2.1 Average active PTTs per month per country

COUNTRY	2006 actual average active PTTs/month	2007 extrapolated average active PTTs/month
AUSTRALIA	303	377
AUSTRIA	2	4
BRAZIL	28	12
CANADA	906	1100
CHILE	15	13
CHINA	23	27
DENMARK	64	68
EUROPE(*)		61
FINLAND	7	6
FRANCE(*)	495	407
GERMANY	206	301
INDIA	102	114
ITALY	34	104
KOREA, REPUBLIC OF	102	116
NETHERLANDS	25	32
NEW ZEALAND	27	24
NORWAY	70	96
SOUTH AFRICA	34	26
SPAIN	95	135
SWEDEN	11	22
SWITZERLAND(**)		12
UNITED ARAB EMIRATES	75	99
UNITED KINGDOM	280	275
UNITED STATES	5974	5727
OTHER	1	4
Total	**8879**	**9160**

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

Table 2: Average number of Active platforms per month and per country, actual in 2006 and extrapolated in 2007 from January-August 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 2007 Consumption per country

COUNTRY	Actual 2006 PTT.years	Extrapolated 2007 PTT.years
AUSTRALIA	81.3	85.0
AUSTRIA	0.1	0.3
BRAZIL	7.2	2.3
CANADA	143.1	182.2
CHILE	1.7	3.1
CHINA	2.9	3.5
DENMARK	23.7	21.2
EUROPE(*)		52.6
FINLAND	2.6	1.4
FRANCE(*)	196.8	106.9
GERMANY	28.9	54.7
INDIA	19.2	24.0
ITALY	13.4	24.1
KOREA, REPUBLIC OF	6.9	13.8
NETHERLANDS	9.7	9.5
NEW ZEALAND	11.5	12.1
NORWAY	27.5	19.9
SOUTH AFRICA	22.1	14.9
SPAIN	20.0	36.0
SWEDEN	1.8	3.0
SWITZERLAND(**)		1.7
UNITED ARAB EMIRATES	19.6	28.0
UNITED KINGDOM	75.4	59.9
UNITED STATES	2600.8	2191.3
OTHER	0.1	0.4
Total	**3316.5**	**2951.7**

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

Table 3: Numbers of PTT.years. Actual consumption in 2006 and extrapolation for 2007 based on January-August 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 2007

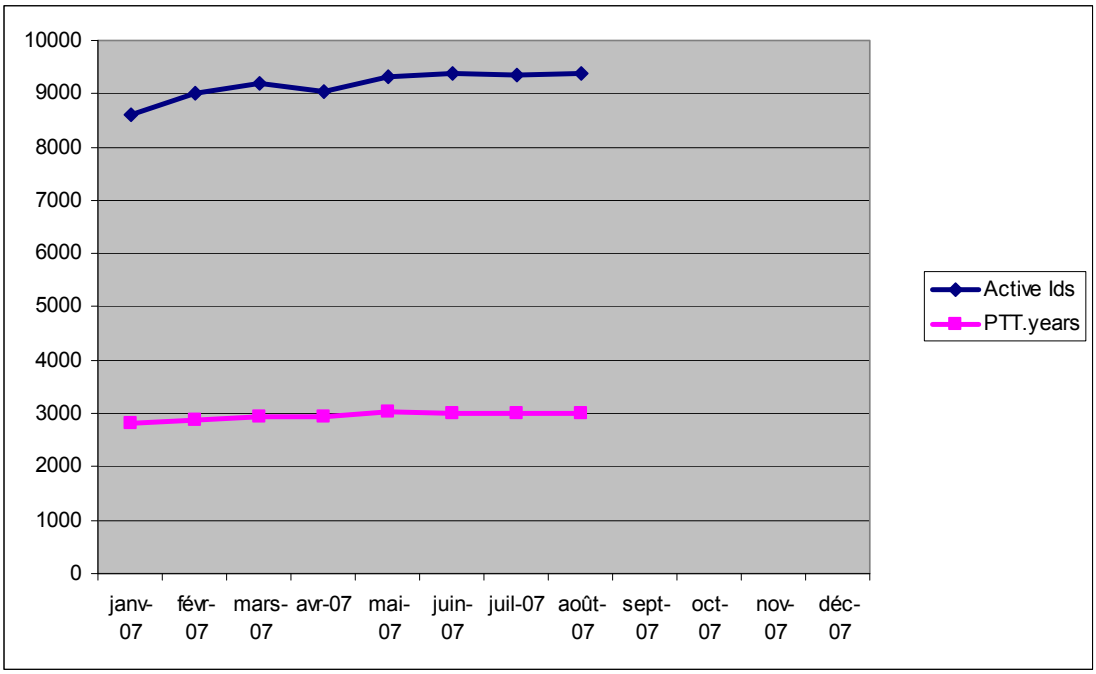


Figure 1: Consumption evolution over the year in Active PTTs and PTT.years

During the 8 first months of 2007, the number of active PTTs has an increasing trend; the number of PTT.years has increased until May and is rather stable after.

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

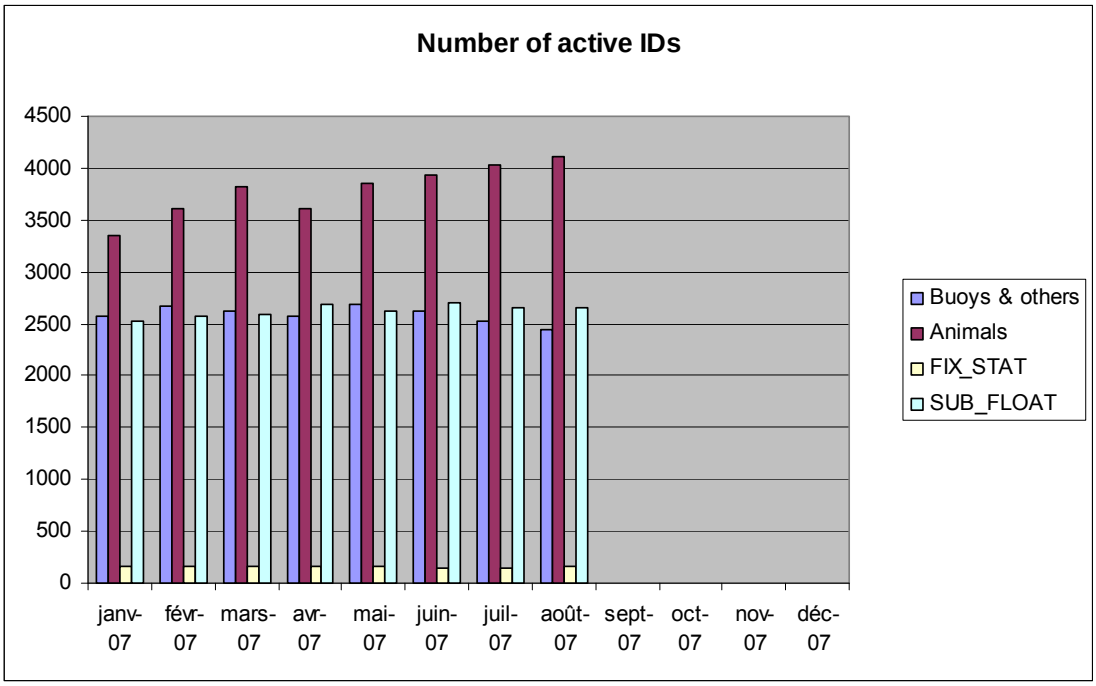


Figure 2: Active PTT evolution

Overall, the active PTTs and thus the number of transmitters in the field are increasing. The main category producing this increase is the "Animals" family. The Subsurface floats are also increasing and have exceeded this year the Buoys & Others family which decreasing.

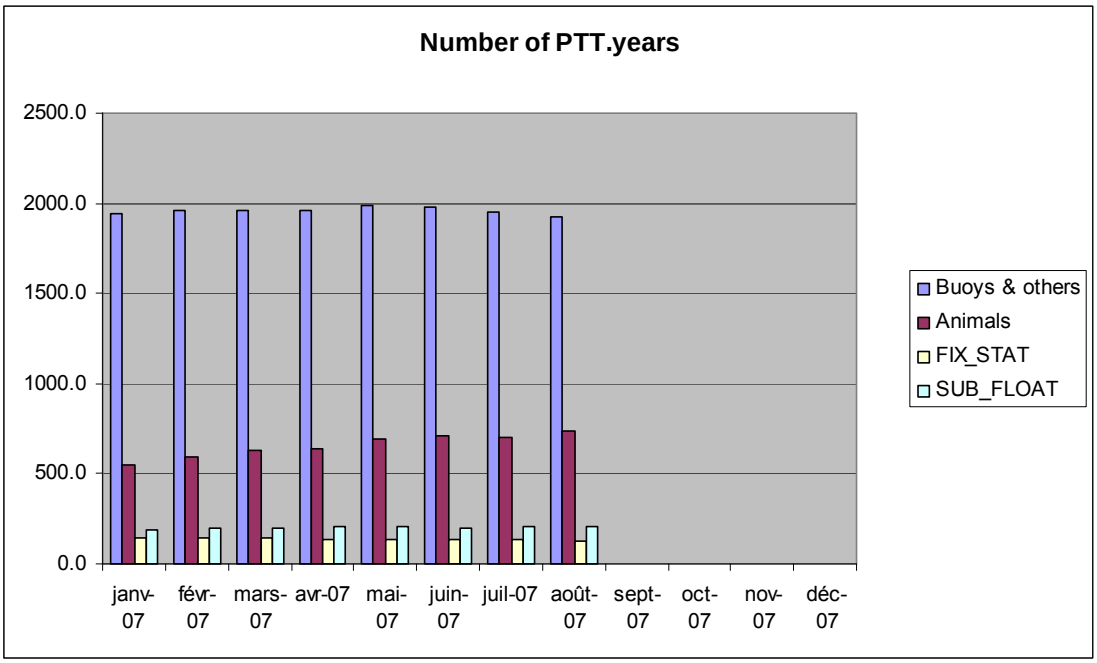


Figure 3: PTT-years evolution

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 per float, 1 to 3 different messages for a fixed station).

2.5 Time slot analysis

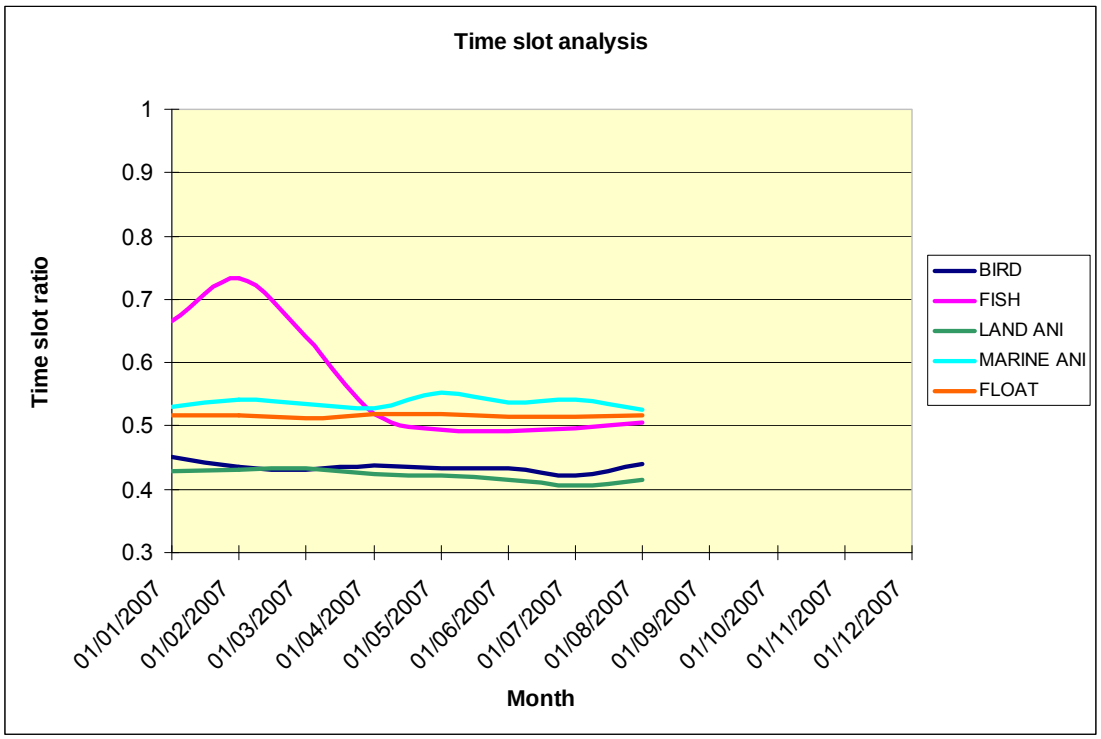
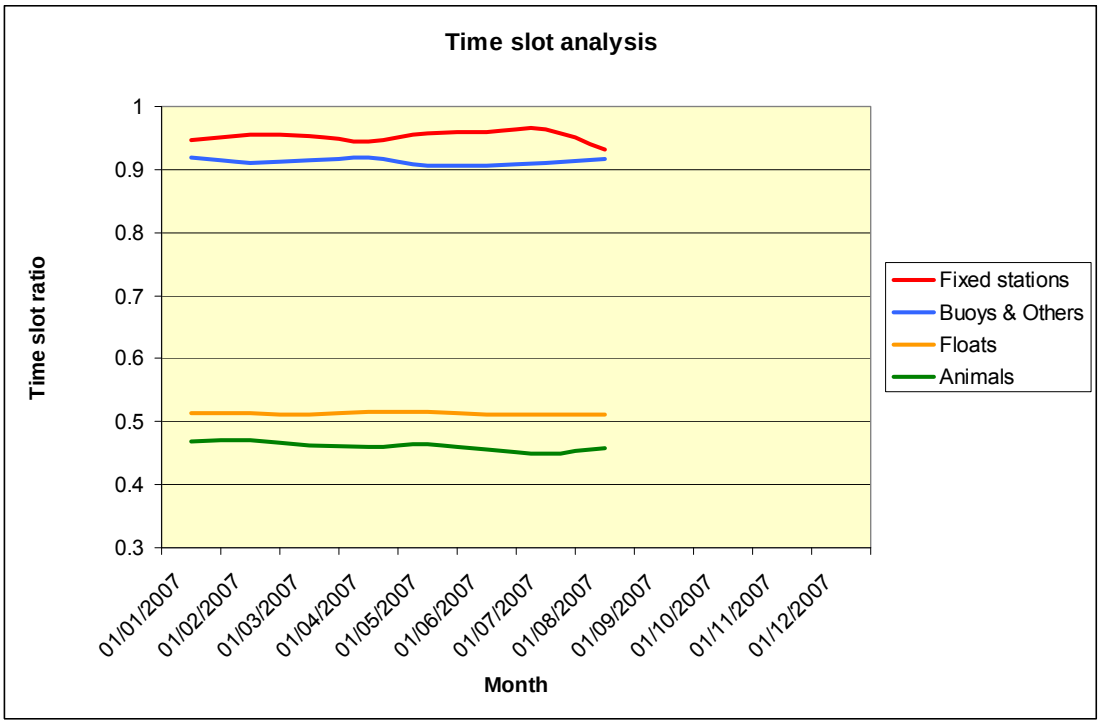


Figure 4: Average time slot level by platform category

This diagram shows the monthly evolution of the average time slot ratio per category of PTTs benefiting from time slot accounting since 2005. For a given PTT, the monthly time slot ratio is calculated as the number of day units divided by the number of transmission days in the month.

It can be noticed that:
- All categories except "Fish" look stable on average.
- The ratio for Marine animals is lower than last year (0.55 instead of 0.60).



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

It can be noticed that, for these latter categories, the time-slot ratio is high – i.e. higher than 90%.

2.6 Inactive status

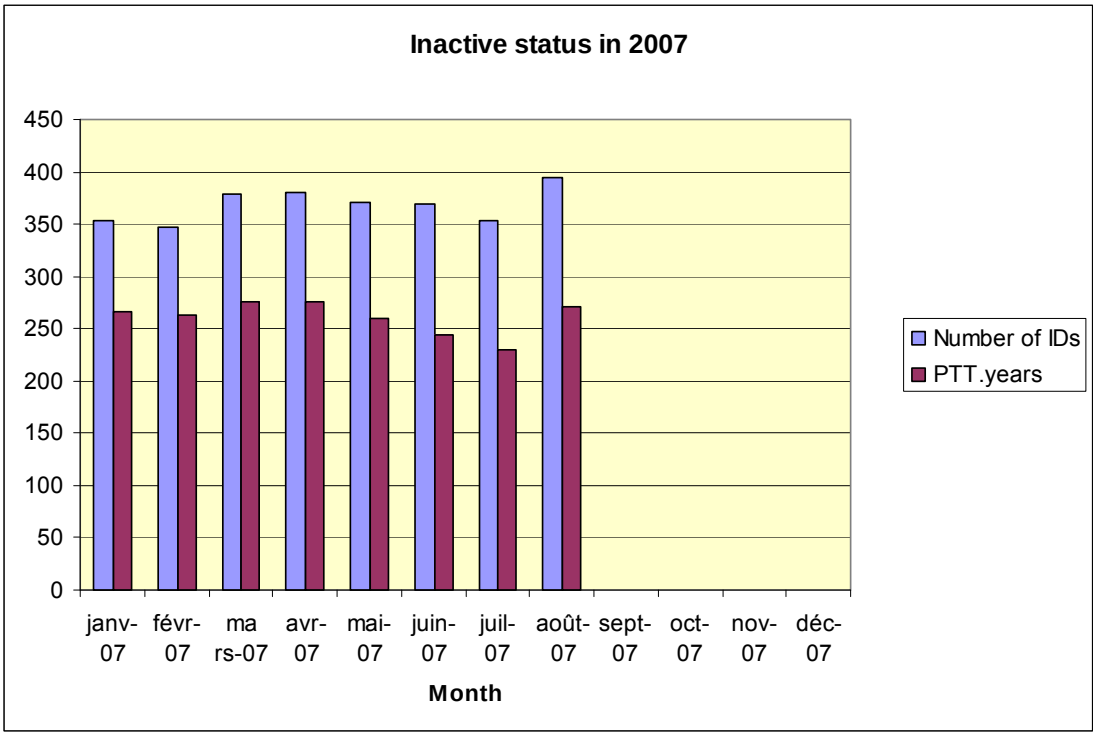


Figure 5: Inactive PTTs evolution in term of number of IDs and PTT-years

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 between 350 and 400. The PTT.year consumption is around 250.

It has to be noted that **more than 350 ID numbers** have been transferred from US programs to a recycling program (out of JTA) and are still transmitting. These PTTs are increasing the system occupancy for no use. CLS insists again on the recommendation to users and manufacturers to consider this by programming their PTTs for the duration of the experiment.

2.7 History of the JTA participation from 1982 to 2006

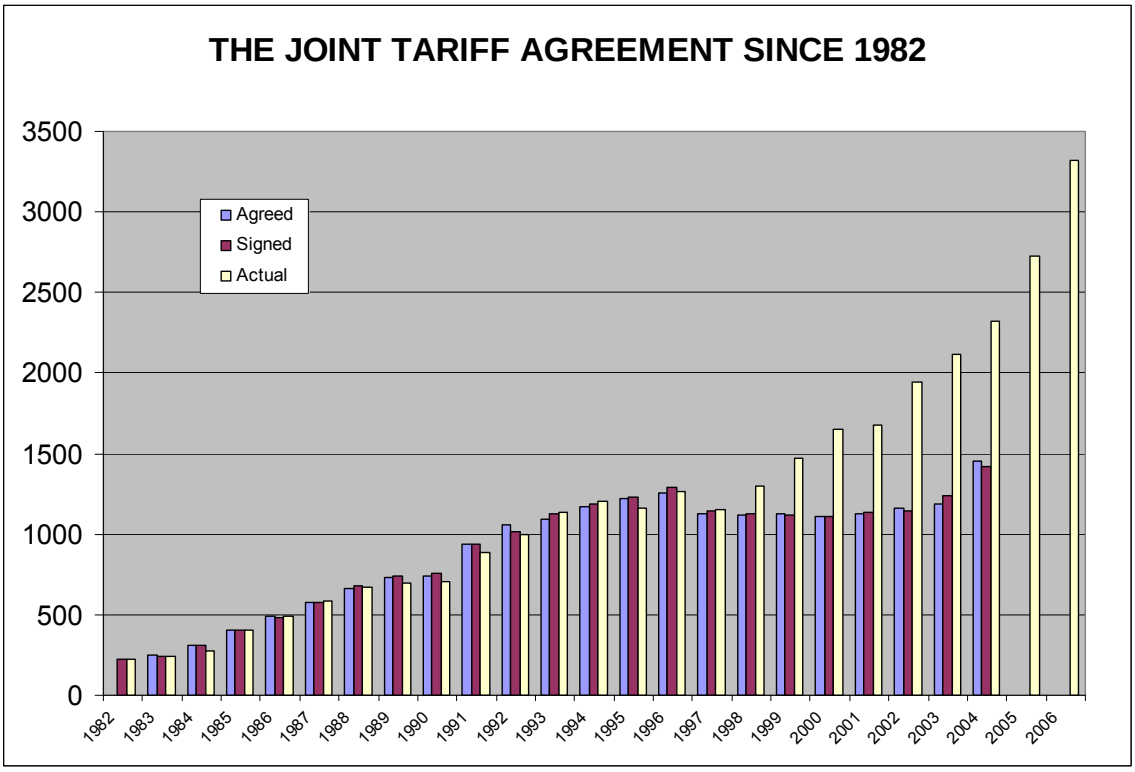


Figure 6: Agreed, signed and actual consumption in PTT.years for all countries (Since new tariff structure in 2005, only actual consumption)

ANNEX IV

REPORT ON 2006-2007 OPERATIONS

1. Space segment

The METOP-A satellite, with the two-way capability Argos 3 instrument onboard, was launched on the 19th of October 2006. It was commissioned on the 21st of May 2007. METOP-A data flows have been processed since the 1st of August 2007.
NOAA-14 (J) was decommissioned on the 23rd of May 2007 after more than 12 years of service.
NOAA-12 (D) was decommissioned on the 10th of August 2007 after more than 16 years of service.

The Argos constellation includes 5 satellites, which are used as follows:

1.1 Basic service satellites

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

1.2 Other satellites

METOP-A, NOAA-18 (N), and NOAA-15 (K) are used as secondary satellites. Global and Regional datasets are collected and delivered according to the "multi-satellite" service characteristics.
The TIP telemetry from NOAA-15 and NOAA-16 has been on STX2 (different polarization) since 31st August 2005.

From Satellite status	July 03	October 03	Dec 03	June 04	May 05	August 06	May 07	August 07
Commissioning					NOAA-18		METOP-A	METOP-A
Basic service	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	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-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	METOP-A NOAA-18 NOAA-15 NOAA-12	METOP-A NOAA-18 NOAA-15
Lost		ADEOS-2						
Decommission				NOAA-11			NOAA-14	NOAA-12

Table 4: Table above displays satellites in service since July 2003

Figure 7 shows Local Equator crossing time (ascending node) and associated predictions for 3, 6 and 12 months in August 2007.

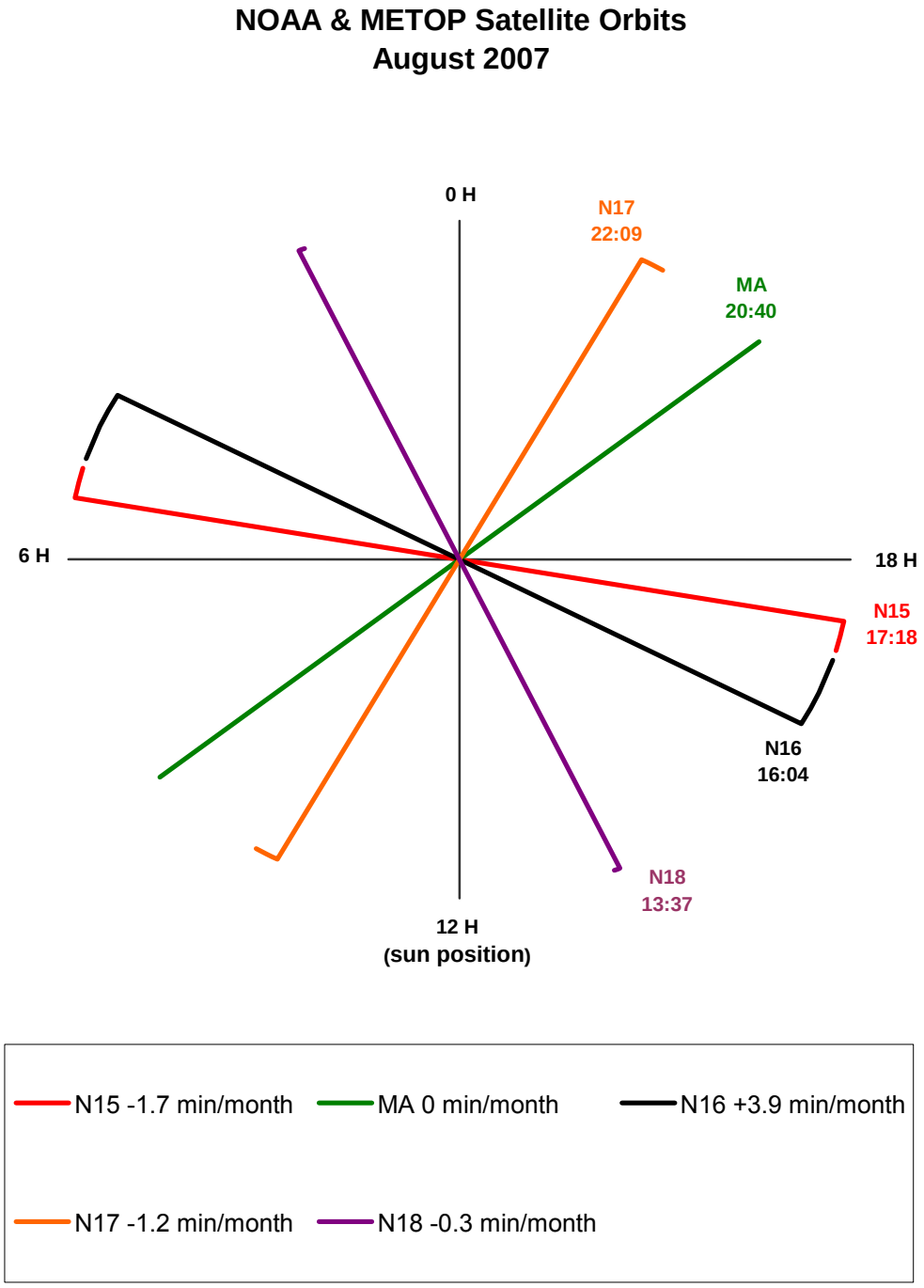
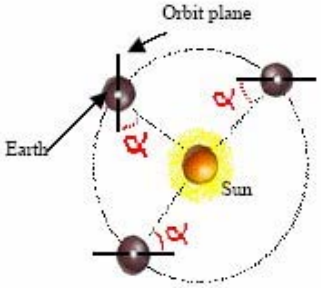


Figure 7

ABOUT ORBIT PLANES

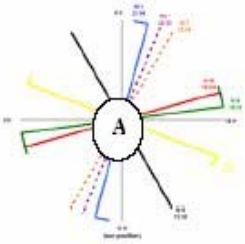
Plane and drift of a Sun-synchronous orbit



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.

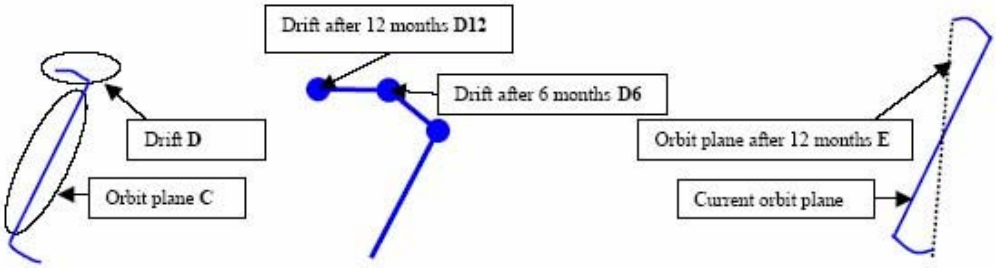
More recent satellites (NOAA17 and NOAA16) exhibit no drift, or very little, because they were positioned so precisely.

Explanation of the diagram - 4-Space segment orbit planes

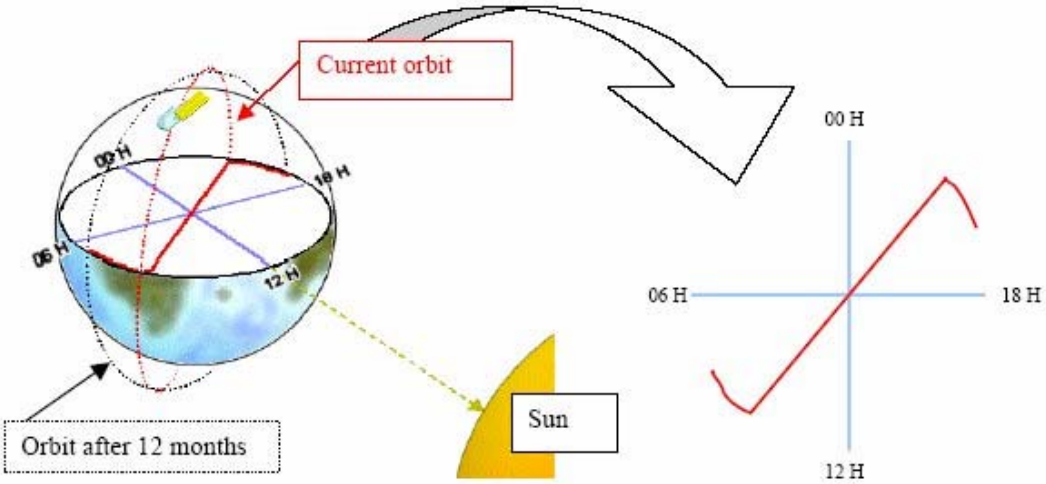


The diagram shows a "bird's eye" view of the Earth. The orbit planes intersect at the North Pole (**A**). The axes are expressed in solar hours, that is, in terms of the position with respect to the Sun: for example, 12 o'clock is facing the Sun (**B**).

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

Global network includes the following two stations:

- Wallops Island, Virginia, USA
- Gilmore Creek, Fairbanks, Alaska, USA

These stations deliver the STIP (Stored TIP) telemetry from the satellites NOAA-15, NOAA-16, NOAA-17, and NOAA-18.

The Lannion global station, which could also acquire the STIP telemetry in some conditions, has not been used since the year 2000. Despite all our efforts to convince NOAA, it seems to be difficult to restart the STIP downloads over Lannion.

Under the Initial Joint Polar System (IJPS) agreement between NOAA and EUMETSAT, the elimination of blind orbits for NOAA-18 is obtained with the addition of a EUMETSAT antenna in Svalbard, Norway. The acquisition of NOAA-18 datasets in Svalbard has been operational since 9th August 2007.

Because the IJPS agreement covers only NOAA-18 and newer satellites, the older satellites, NOAA-17, NOAA-16 and NOAA-15, 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 NOAA-17, NOAA-16 and NOAA-15 can be provided by later on.

Figure 8 shows, for the 31st December 2006, the global data set (STIP) arrival times at the Toulouse and Largo processing centres during the day. Ideally, if there was no downloading and transmitting delay, one data set should be received every 100 minutes (1h40).

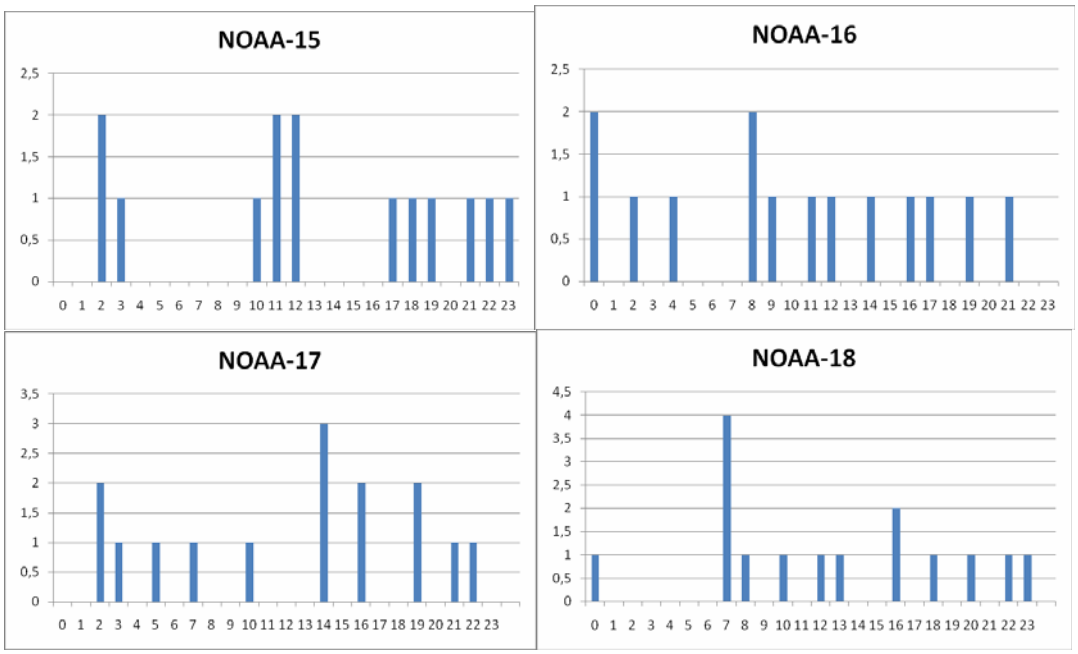


Figure 8: Global dataset (STIP) arrival times at a global processing centre on 31 Dec 06

2.2 Regional stations

Eight new stations were added to the Argos network during the year.

Three receive the HRPT from the 4 NOAA working satellites (15/K, 16/L, 17/M, 18/N): Andersen, Guam Is., and USA, operated by USAF
Hikam, Hawaii, USA, operated by USAF
Valley Forge, Pennsylvania, USA, operated by Lockheed Martin

Four receive the HRPT from 3 NOAA working satellites (15/K, 17/M, 18/N):
Elmendorf, Alaska, USA, operated by USAF
Kadena, Japan, operated by USAF
Lajes, Azores, Portugal, operated by USAF
Sembach, Germany, operated by USAF

One receives the HRPT from 3 NOAA working satellites (16/L, 17/M, 18/N):
Cape Ferguson, Queensland, Australia, operated by USAF

The figure 9 below shows the visibility area of each antenna of the network.

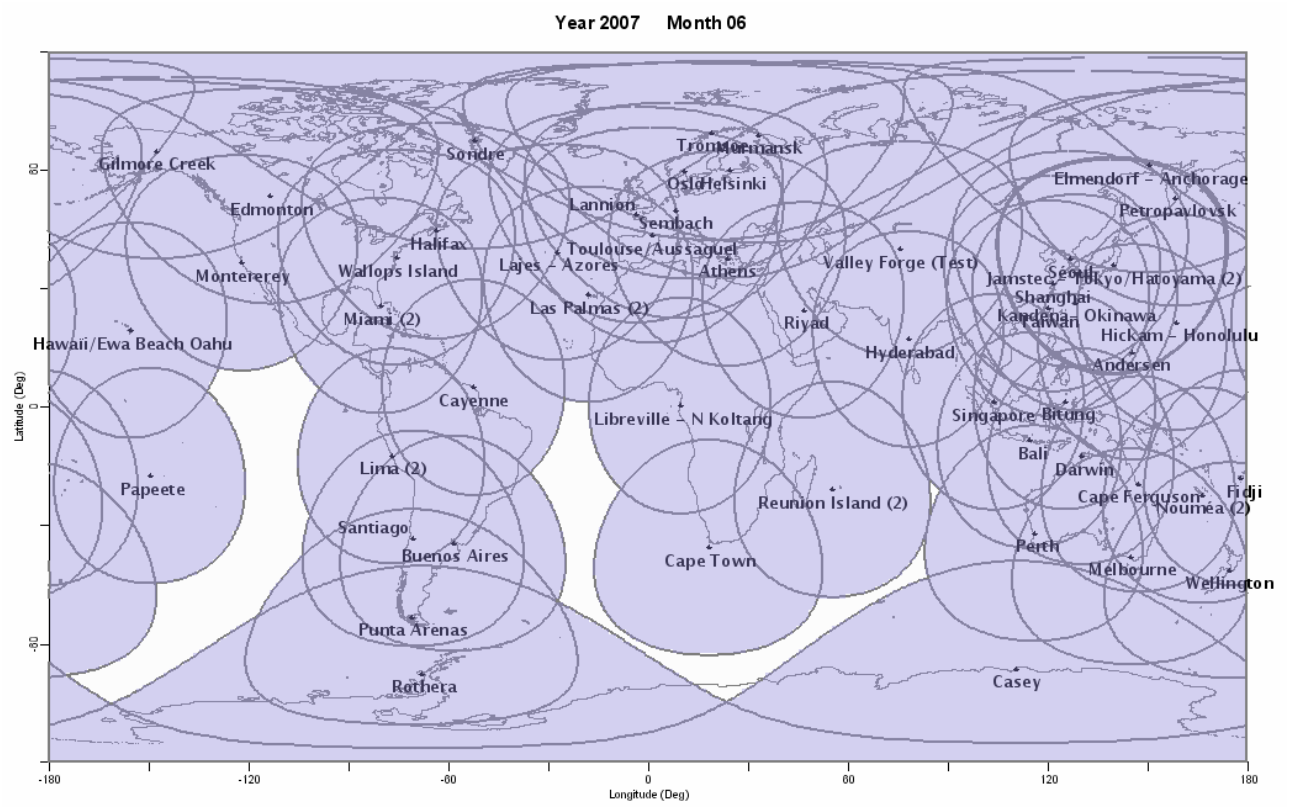


Figure 9: Argos network of regional receiving stations in June 2007

Antennas	Sigle	Country	Operator	Possible satellites
Andersen	AN	GUAM	US AIR FORCE	NK,NM,NN
Athens	AT	GREECE	CLS	NK,NL,NM,NN
Aussaguel	AU	FRANCE	CLS	NK,NL,NM,NN
Buenos Aires*	BA	ARGENTINA	INTA	NK,NL,NM
Bitung	BI	INDONESIA	PT CLS INDONESIA	NK,NL,NM,NN
Bali	BL	INDONESIA	PT CLS INDONESIA	NK,NL,NM,NN
Casey	CA	AUSTRALIA	BOM	NK,NL,NM
Cape Ferguson	CF	AUSTRALIA	NOAA NESDIS	NL,NM,NN
Santiago	CH	CHILE	METEO CHILE	NK,NL,NM,NN
Las Palmas	CN	SPAIN	CLS	NK,NL,NM,NN
Cayenne	CY	FRANCE	IRD	NK,NL,NM
Darwin	DA	AUSTRALIA	BOM	NK,NM
Ewa Beach Oahu	EB	UNITED STATES	NOAA NESDIS	NK,NL,NM,NN
Edmonton	ED	CANADA	ENVIRONNEMENT CANADA	NK,NL,NM
Elmendorf - Anchorage	EL	UNITED STATES	US AIR FORCE	NK,NM,NN
Fiji	FI	FIJI	SIT	NK,NM
Libreville - N Koltang	GB	GABON	CLS	NK,NL,NM,NN
Gilmore Creek	GC	UNITED STATES	NOAA NESDIS	NK,NL,NM,NN
Sondre	GR	GREENLAND	DMI	NK,NL,NM
Hatoyama	HA	JAPAN	NASDA	NM
Halifax	HF	CANADA	CANADIAN COAST GUARD	NK,NL,NM
Hickam - Honolulu	HI	UNITED STATES	US AIR FORCE	NK,NL,NM,NN
Helsinki	HL	FINLAND	CLS	NK,NL,NM,NN
Hatoyama	HT	JAPAN	Jaxa	**MA**,NK,NL,NM,NN
Hawaii	HW	UNITED STATES	NOAA NWS	NK,NL,NM
Hyderabad	HY	INDIA	INCOIS	NK,NL,NM,NN
Jamstec - Tokyo	JM	JAPAN	CUBIC-I	NK,NL,NM,NN
Kandena- Okinawa	KA	JAPAN	US AIR FORCE	NK,NM,NN
Lajes - Azores	LA	PORTUGAL	US AIR FORCE	NK,NM,NN
Lima	LM	PERU	CLS PERU	**MA**,NK,NL,NM,NN
Las Palmas	LP	SPAIN	IRD	NK,NL,NM
Miami	MA	UNITED STATES	NOAA AOML	NK,NL,NM
Melbourne	ME	AUSTRALIA	BOM	NK,NL,NM,NN
Miami	MI	UNITED STATES	NOAA NESDIS	NK,NL,NM
Montererey	MO	UNITED STATES	NOAA NESDIS	NL,NM,NN
Nouméa	NC	NEW CALEDONIA	METEO FRANCE	NK,NM,NN
Nouméa	NO	NEW CALEDONIA	IRD	NK,NM
Wellington	NZ	NEW ZEALAND	MET OFFICE	NK,NL,NM
Oslo	OS	NORWAY	NMI	NK,NL,NM,NN
Punta Arenas	PA	CHILE	METEO CHILE	NK,NL,NM
Perth	PE	AUSTRALIA	BOM	NK,NL,NM,NN
Lima	PR	PERU	CLS PERU	NK,NL,NM,NN
Petropavlovsk	PT	RUSSIAN FEDERATION	COMPLEX SYSTEM	NK,NL,NM,NN
Reunion Island	RE	FRANCE	IRD	NK,NL,NM
Reunion Island	RN	FRANCE	METEO FRANCE	NL,NM
Rothera	RO	UNITED KINGDOM	UK MET OFFICE	NK,NL,NM,NN
Murmansk	RU	RUSSIAN FEDERATION	COMPLEX SYSTEM	NK,NL,NM,NN
Toulouse	RV	FRANCE	CLS	NK,NL,NM,NN
Riyadh	RY	SAUDI ARABIA	CLS	NK,NL,NM,NN
Cape Town	SA	SOUTH AFRICA	SAWB	NK,NL,NM,NN
Séoul	SE	KOREA	KMA	NK,NL,NM,NN
Singapore	SG	SINGAPORE	SMM	NK,NM
Shanghai	SH	CHINA	EAST CHINA SEA FISHERIES	NK,NL,NM,NN
Sembach	SM	GERMANY	US AIR FORCE	NK,NM,NN
Tromsoe	ST	NORWAY	KSAT	NK,NL,NM,NN
Papeete	TA	FRANCE	IRD	NK,NL,NM,NN
Taïwan	TW		NTOU	NK,NL,NM,NN
Valley Forge (Test)	UA	UNITED STATES	US AIR FORCE	NK,NL,NM,NN
Lannion	WE	FRANCE	METEO FRANCE	NL,NM,NN

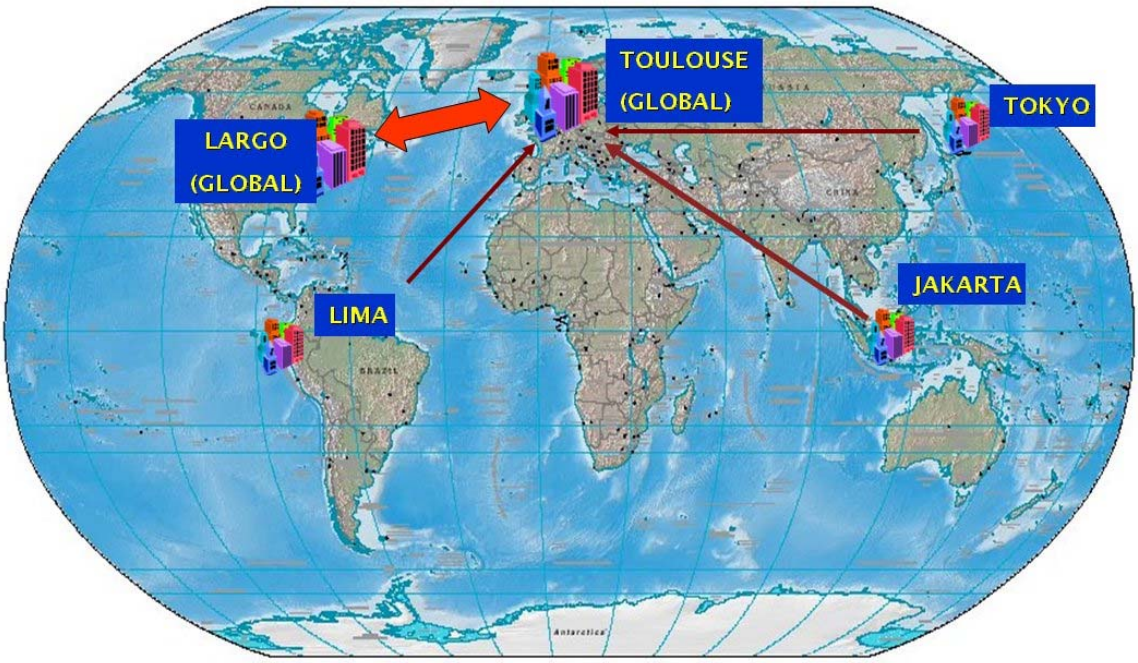
Wallops Island	WI	UNITED STATES	NOAA NESDIS	NK,NL,NM,NN

***** the only station to locate the satellites when they are situated at a 20° site angle

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)

3. Processing centres



3.1 Global processing centres

The two global processing centres in Toulouse and Largo functioned as expected. More than 1000 data sets per day (100 STIP data sets, 900 Real-time data sets) are processed in each centre. Figure 10 shows the number of datasets processed per day during the month of December 2006.

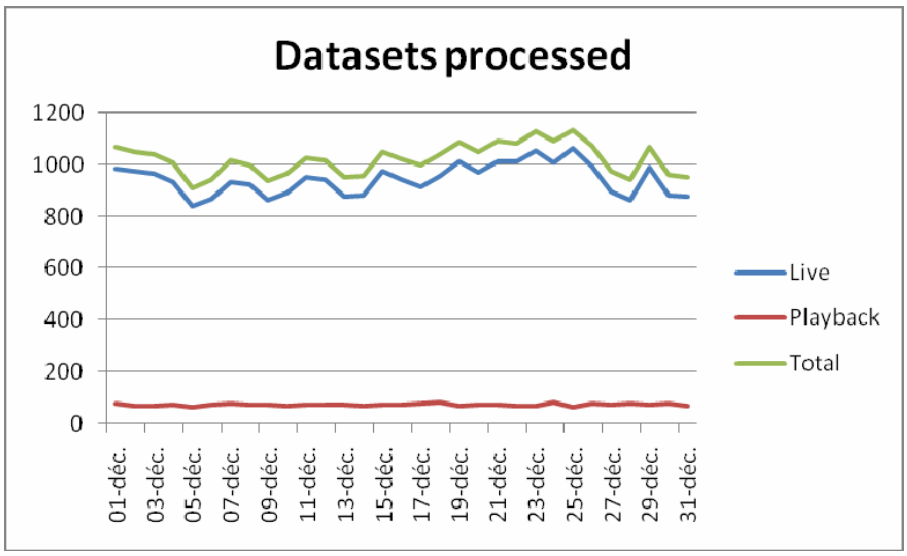


Figure 10

Operational validation of Argos 2001 Phase 3A software was completed in June 2006. The new database and screens have been installed at both global User Offices.

3.2 Regional Processing Centres

The three regional processing centres in Tokyo (Japan), Lima (Peru), and Jakarta (Indonesia) only process data sets from stations within their region. Supplementary data providing global coverage are supplied by the Toulouse centre or by the Largos centre, if necessary. No problem appeared last year in the three regional processing centres.

3.3 Processing Centres' Activity

The number of operating Argos platforms continues to increase. In June 2007, more than 9,600 platforms were seen on average per day (figure 11). However, each of the two global centres processed data from about 17,800 individual platforms during this month (figure 12).

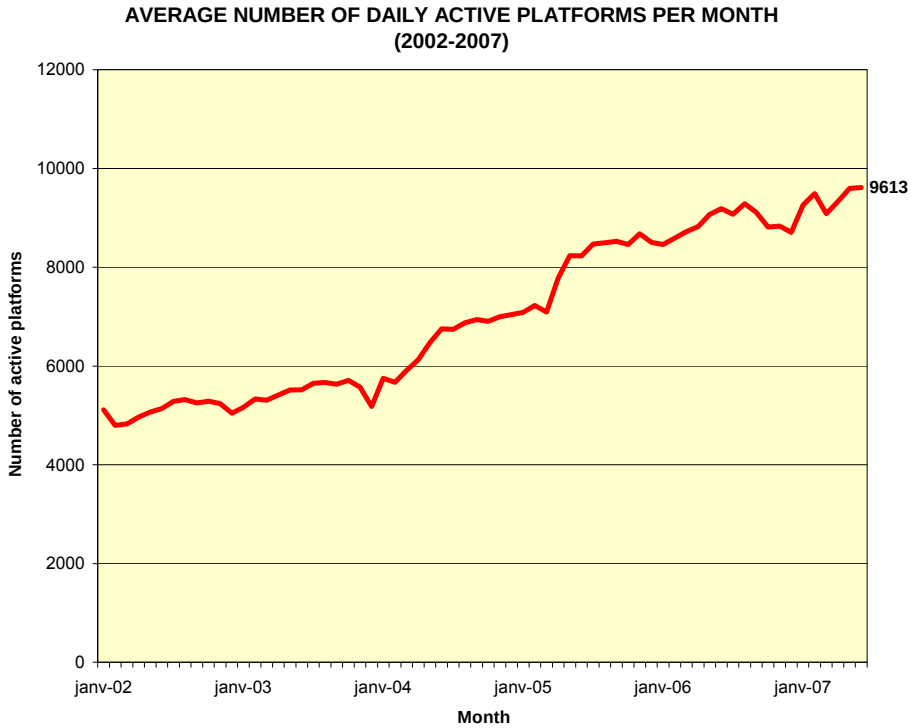


Figure 11

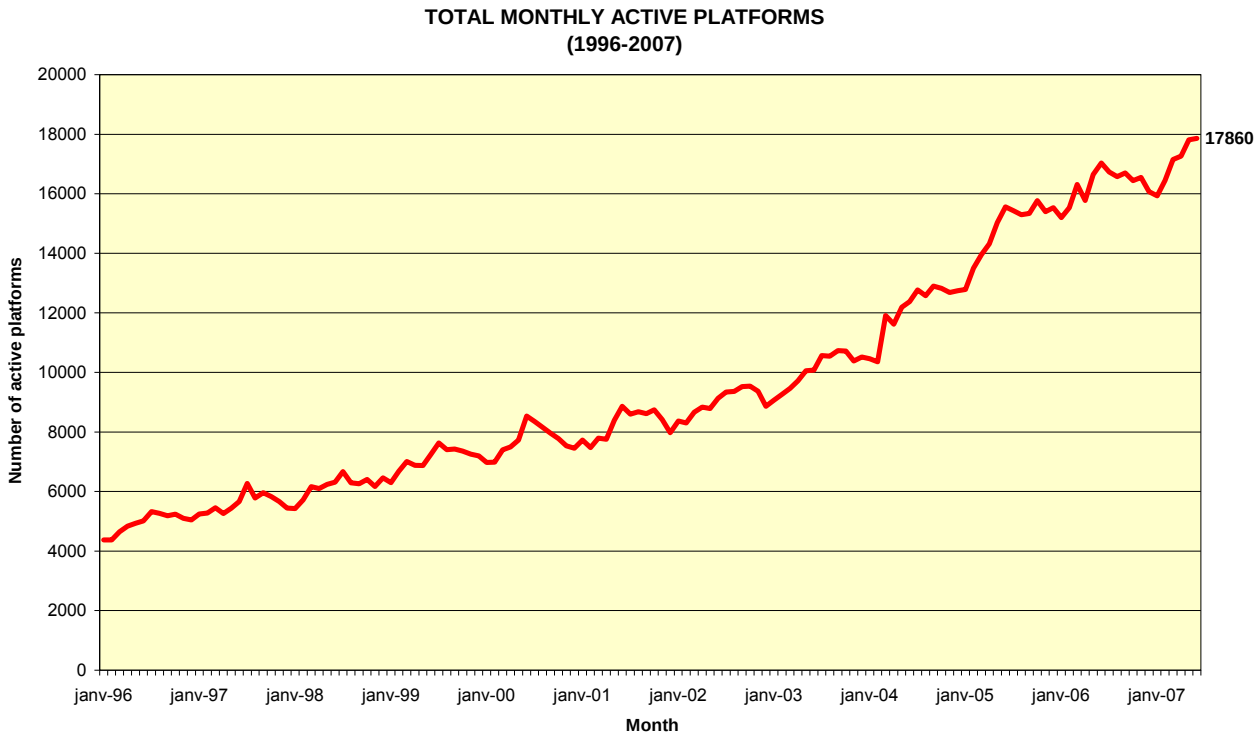


Figure 12

In June 2007, Largo and Toulouse centres processed, on average, 70,000 locations, and 1,000,000 messages per day.

Figure 13 shows the ARGOS availability at CLS in 2006. In January and February 2006, ARGOS availability system was impacted by TELNET consultation anomalies. Nevertheless, the average monthly availability during this 12-month period was 99.54%. When services were unavailable in CLS, CLS America Inc. was on backup.

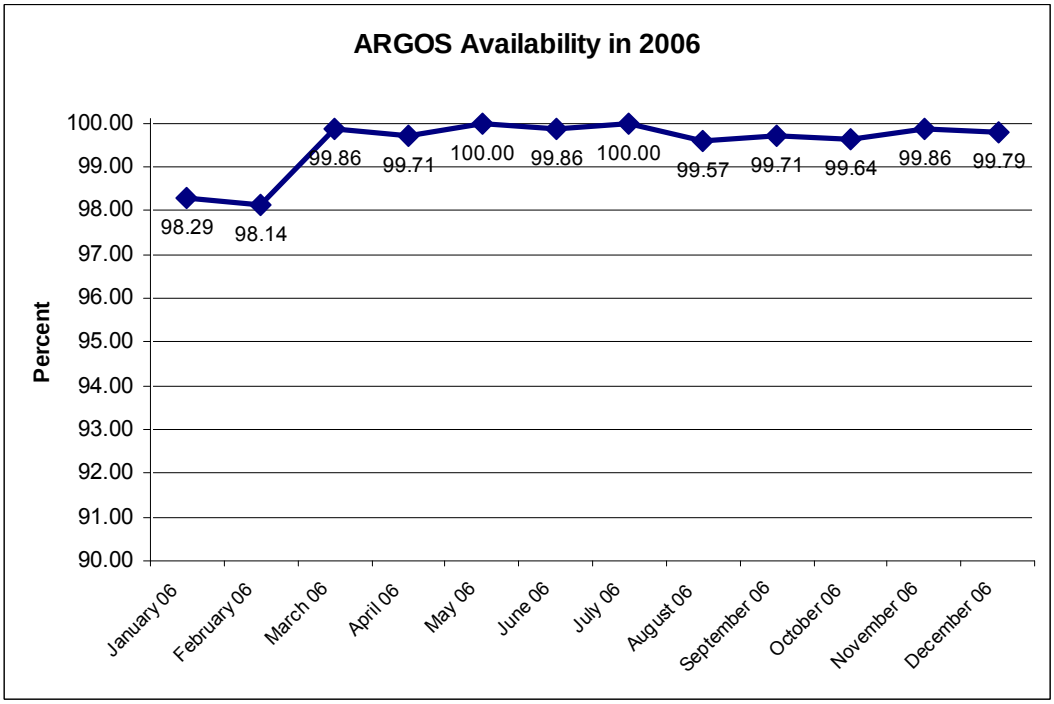


Figure 13

4. Communication links

CLS and CLS America have improved its Internet link and are now connected each other to 2 different providers: CLS America has two lines at 1.5Mbps and CLS has two lines at 2 Mbps and 4 Mbps.

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

CLS America Inc has stopped the X25 protocol, but continues to be utilised and maintained by the Toulouse centre to send data to a few users (less than 20) who have security concerns. This X25 protocol was maintained throughout 2006.

5. Throughput time for delivery results

As far as GTS distribution is concerned, as in the past, the following delays must be considered and addressed:

1. The length of time that observations are stored onboard the buoy before actual data transmission to the satellite, i.e. back-hour delays for recorded observations (platform programming dependant), and time waiting for the satellite to be in view of the buoy (a function of the platform position - mainly latitude - and NOAA satellites' orbits)

2. The duration of any one satellite pass, as the data transfer and then processing may not occur until the end of the pass

3. Time taken to transfer data sets to the global processing centres. Most regional data are transferred via the Internet. The transfer rate is regularly improving, however delays may occur as follows:
   (i) orbital delays (global system only)
   (ii) prolonged transfer of data from receiving stations to the Argos global processing centres.

4. Time taken to process the data set by the global processing centres, though this is rarely significant, typically less than 30 seconds.

5. GTS data processing at CLS Argos

6. GTS bulletins routing delays.

The impact of the extension of the Argos network on regional receiving stations can be estimated - thanks to the 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 centre.

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	**15 %**
< 1 h 30	**29 %**
< 2 h	**45 %**
< 2 h 30	**62 %**
< 4 h	**82 %**

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

Those delivery times will be significantly improved with the Svalbard station 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 shows the throughput time for real-time result delivery from NOAA-18, NOAA-17, NOAA-16, and NOAA-15 and acquired by the HRPT receiving stations.

Satellite Delivery	NOAA-15, NOAA-16 NOAA-17 & NOAA-18
< 10 minutes	15 %
< 15 minutes	45 %
< 30 minutes	85 %
< 45 minutes	88 %

Table 7: 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 regional stations during the month of June 2007. It also shows the differed time mean data availability delay for the rest of the data.

The ocean regions where efforts must be made to provide more data in real-time are

- South Atlantic Ocean,
- South-East Pacific Ocean,
- North of Indian Ocean (Hyderabad station is not functioning properly).

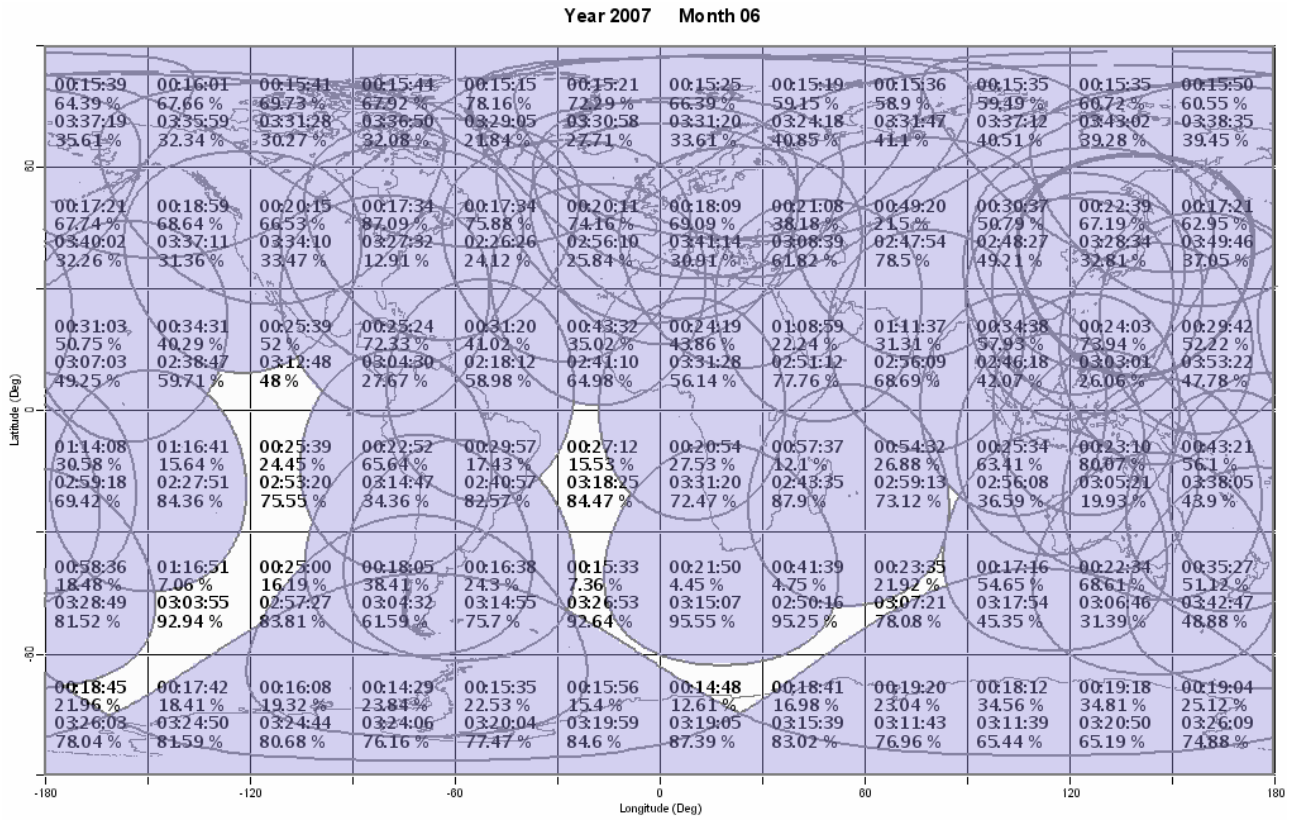


Figure 14
30°x30° squares
1st row: Real time mean data availability delay
2nd row: Percentage of data received in real time

3rd row: Differed time mean data availability delay
4th row: Percentage of data not received in real time

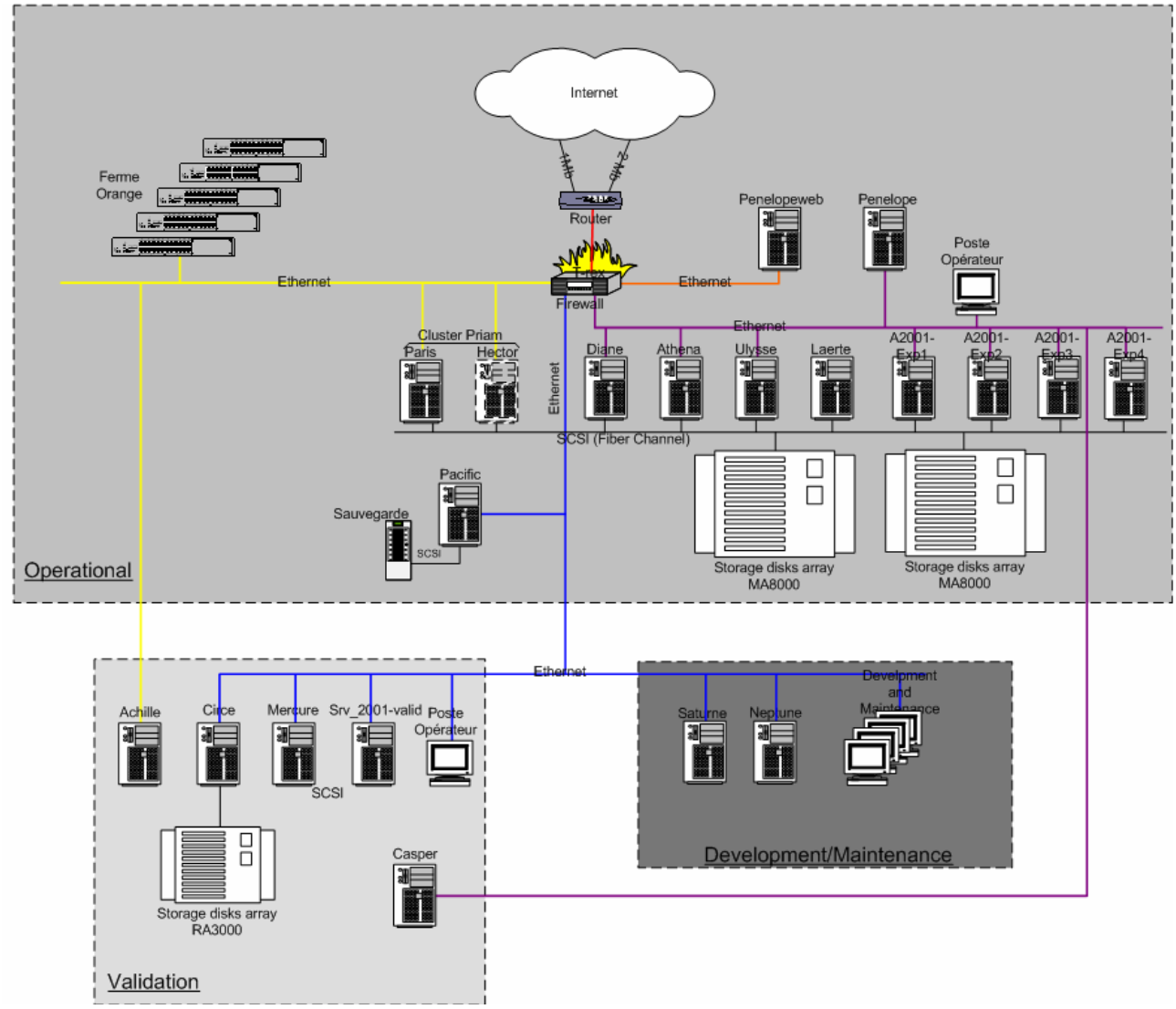
ANNEX V

SYSTEM IMPROVEMENTS

1. Hardware and software configuration

1.1 Hardware Configuration

The computing architecture dedicated to the Argos system is still the same and no significant modification is to be mentioned since last year.



The heart of the architecture is composed of two high-performance disk storage arrays to which the servers involved in the process of the Argos data are connected, via the fibre channel links.

The operational configuration is of course dedicated to the acquisition, the processing, and the dissemination of the Argos data, 24 hours a day, throughout the year. The development and maintenance of the Argos software are performed on a dedicated architecture. The third configuration, and the validation configuration, is used to validate all software modifications and corrections before being installed at the level of the operational configuration.

Our project of creating a second computing centre in CNES ("Disaster Recovery Plan") in addition to the existing CLS computing centre is still alive even if the installation of the communication links between both centres caused a big delay in the project. It seems that the problems are now fixed. The project can go on.

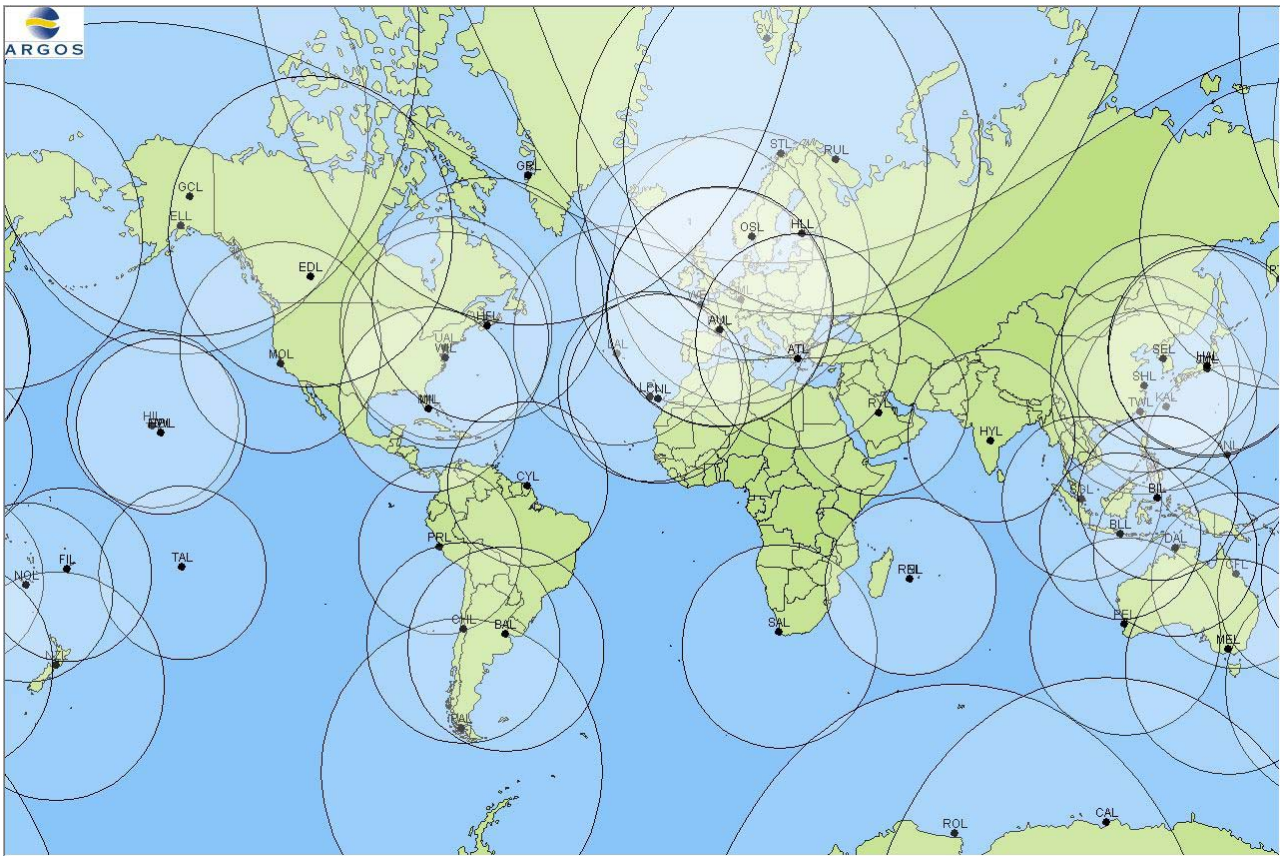
1.2. Ground Segment Architecture

Eight new stations were added to the Argos network during the year.

Three receive the HRPT from the 4 NOAA working satellites (15/K, 16/L, 17/M, 18/N): Andersen, Guam Is., and USA, operated by USAF
Hikam, Hawaii, USA, operated by USAF
Valley Forge, Pennsylvania, USA, operated by Lockheed Martin

Four receive the HRPT from 3 NOAA working satellites (15/K, 17/M, 18/N):
Elmendorf, Alaska, USA, operated by USAF
Kadena, Japan, operated by USAF
Lajes, Azores, Portugal, operated by USAF
Sembach, Germany, operated by USAF

One receives the HRPT from 3 NOAA working satellites (16/L, 17/M, 18/N):
Cape Ferguson, Queensland, Australia, operated by USAF



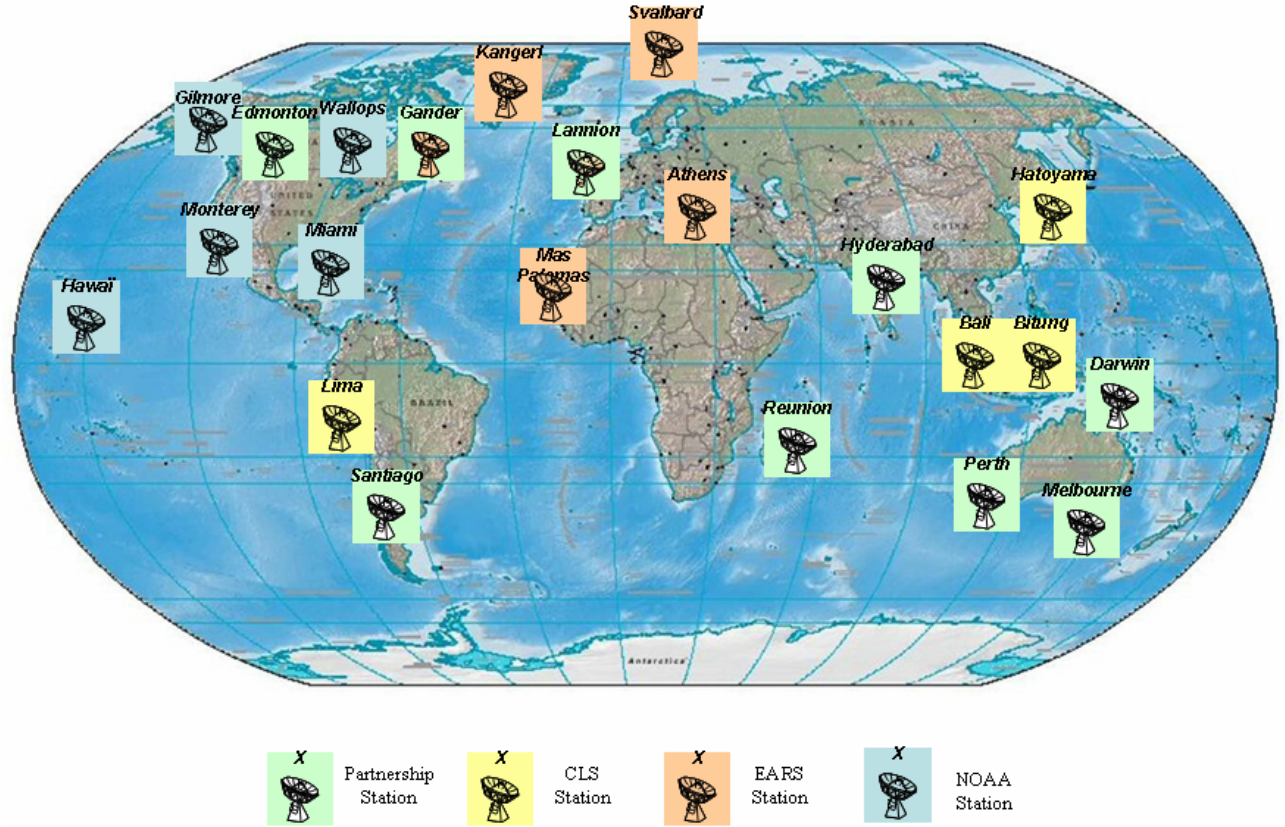
This network was built as time goes by, usually to respond to the needs of specific areas of the world and from time to time by taking advantage of the cooperation opportunities, which were offered.

Even if we are ready to consider any new opportunity of cooperation, we would like to now focus our efforts on adding new ground stations compatible with NOAA and METOP satellites.
To initiate this new acquisition network, CLS has based its strategy accordingly to two main axis:
- to invest in its own NOAA/METOP stations,
- to cooperate with a partnership network.

CLS has already bought four NOAA/METOP ground stations. Two of them are located in Indonesia, Bali and Bitung. One is installed in Lima, the other in Hatoyama (Japan) and are already operational for METOP.

Regarding the partnership network, CLS is in contact with NOAA, EUMETSAT (EARS network) and several other meteorological agencies such Environment Canada, Meteo Chile, Meteo France, INCOIS (India) and Bureau of Meteorology (Australia).

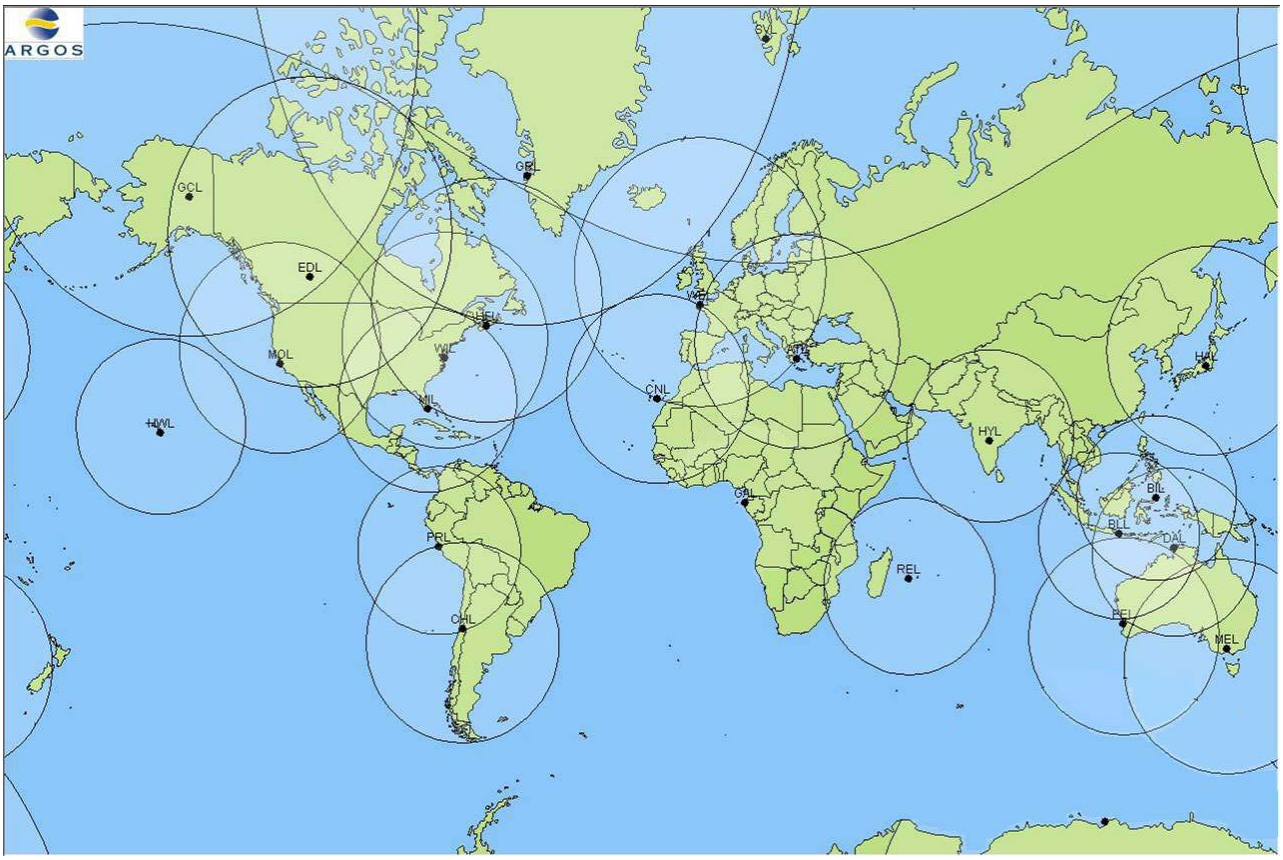
Today, the expected NOAA/METOP network is the following:



	Antenna	Country	Operator
1	Darwin	Australia	BOM
2	Melbourne	Australia	BOM
3	Perth	Australia	BOM
4	Bali	Indonesia	CLS
5	Bitung	Indonesia	CLS
6	Hatoyama	Japan	CLS
7	Lima	Peru	CLS
8	Kangerlussaq	Greenland	EARS - Danish Meteo Institute
9	Svalbard	Norway	EARS - EUMETSAT
10	Athens	Greece	EARS - HNMS (Meteo)
11	Mas Palomas	Spain	EARS - INTA
12	Edmonton	Canada	Environment Canada
13	Gander	Canada	Environment Canada
14	Hyderabad	India	INCOIS
15	La Reunion	France	IRD
16	Santiago	Chile	Meteo Chile
17	Lannion	France	Meteo France

18	Gilmore / Fairbanks	USA	NOAA
19	Hawaii	USA	NOAA
20	Miami	USA	NOAA
21	Monterey	USA	NOAA
22	Wallops	USA	NOAA

In term of coverage, we could expect:



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 centres

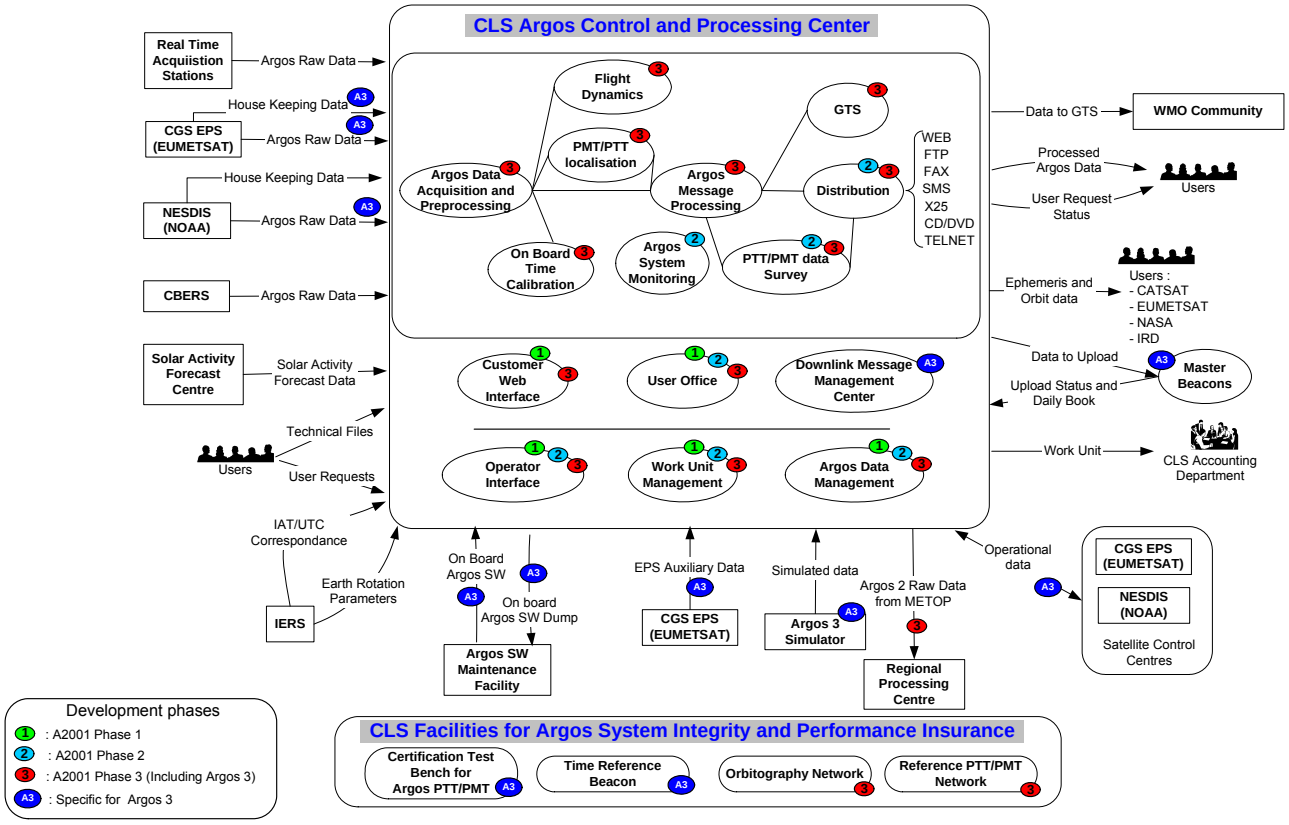
The three regional processing centres (Tokyo, Lima, and Jakarta) operated without any major hitch in 2006-2007.
In Melbourne, there is no longer a regional processing centre but the User Office is still operational for regional users, mainly for Australia and New Zealand.

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 centre, 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 to better serve the users and for the long-term continuity of the Argos system.
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 will also be implemented during this phase. Data will be stored and managed by a database management system designed to be receptive to users' needs.

Phase II: Improvement and development of value-added services and tools for the monitoring of the Argos system.

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

- IIIA : Redesign of Argos (messages) processing chain
- IIIB : Redesign of GTS (observations) processing chain

Current status:

Phases I and II have been operational for several years.

Phase III: Phase IIIA was in operation in September 2007 and Phase IIIB at the beginning of 2008.

2.2 Argos 3 Ground Segment (SSA3 Project)

In March 2003, a new and major project was started 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 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 have been completed and validated before the launch of the first METOP satellite, on October 19th 2006, and during its commissioning.

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 Processing Centre: It includes all sub-systems modified due to the Argos 3 capabilities and characteristics, including the DMMC (Downlink Message Management Centre),
- Time Reference Beacon,
- A new network of master beacons (high data rate platforms),
- Argos PTT/PMT test bench.

2.2.1 Argos 3 Control and Processing Centre

The Argos Processing centre is made of several sub-systems. Each sub-system is independent regarding the integration and validation of the centre. These subsystems are:

- o 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 Centre. Due to the failure of ADEOS II mission, DMMC is now fully dedicated to Argos 3 instrument. It was fully delivered in September 2005.

The integration tests with EUMETSAT started in July 2005. The data is 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 Argos 3 telemetry processing and downlink message management have been tested, including functions requiring the onboard instrument to be commissioned.

2.2.2 Time Reference Beacon

The new generation of the Time Reference beacon is operational and successfully used during the Argos 3 commissioning phase.

2.2.3 Master Beacon

Three Master Beacons, compliant with Argos 3 instrument, have been installed in Svalbard, Fairbanks, and Toulouse and are operational.

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. This test equipment is now planned to be upgraded to improve its performances and to add functionalities. These improvements are driven by CNES.

2.3 PTT/PMT for users

The Argos-3 satellite generation will allow users to have a two-way communication as well as a better control of uplinks at a higher data rate. To access these new facilities, users will have to implement a PMT (Platform Message Transceiver) in place of their current PTT.
This module, working as a modem, will support:
- Transmission of uplink messages using several possible modulation links as well as satellite pass predictions
- Reception and processing of downlink messages (commands, predefined messages, satellite acknowledgement…)
- Communication with the platform for the acquisition of sensors and delivery of an acknowledgement, when data have been correctly transmitted and acknowledged by satellites.

Users will access these functions in two steps: The first one through "PMT demo units" or first generation PMTs, currently available. The second one through "Industrial PMT RF modules" that will be available at the beginning of 2008.

A. <u>First Generation PMT</u>

The CLS project of developing a PMT started in 2002 with Bathy Systems (Boston, USA) and Seimac Ltd (Halifax, Canada), a major transmitter manufacturer. A set of 80 “First Generation" PMTs is now available.

These PMTs work on both BPSK and GMSK modulations (downlink at 400 bits/sec and new data rate uplink at 4800 bits/sec).

The first interactive session between METOP-A and a PMT worked perfectly well on May 10th, 2007.

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 was 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. A tender was issued and two manufacturers (Kenwood in Japan and ELTA in France) were selected in February 2006 to provide users with industrial PMTs at cost equal or lower than the current one-way PTTs. The commissioning tests are on their way and a first set of PMTs should be available at the beginning of 2008.

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-14 was decommissioned on 23rd May 2007 and NOAA-12 on 10th August 2007. Both satellites were Argos-1 instruments, with a reception frequency range of 24 kHz centred on 401.650 MHz. Now the constellation is made of 5 satellites: 4 NOAA and 1 METOP.

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 POE's data.*

Status: Under the Initial Joint Polar System (IJPS) agreement between NOAA and EUMETSAT, the elimination of blind orbits for NOAA-18 is obtained with the addition of a EUMETSAT antenna in Svalbard, Norway. The acquisition of NOAA-18 datasets in Svalbard has been operational since 9th August 2007.

Because the IJPS agreement covers only NOAA-18 and newer satellites, the older satellites, NOAA-17, NOAA-16 and NOAA-15, 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 NOAA-17, NOAA-16, and NOAA-15 will be provided later on.

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: Two satellites, SCD1 andSCD2 are delivering data. Further to oral agreement between INPE and CLS, real time SCD1 and 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 just data messages since the INPE system does not provide locations. Global processing centres at this stage do no processing.

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, it functioned properly at the end of October.

Duplicates

In some circumstances, the Argos GTS time tagging process generated duplicated observations. This affected 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, and then processes it. S-T-D samples are then complete.
This was implemented in September 2005 and definitely corrected in June 2006.

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 took place in Summer 2007.

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 chairperson D. Meldrum reminded UK Met Office about this topic. A reply should be forthcoming soon.

3.1.6 St Helena Island LUT:

CLS installed an antenna in Gabon in April 2007. This increases 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. For the moment, CLS has no plan to supply a LUT in St Helena.

3.1.7 South African LUTs:

In 2006, CLS made a proposal to the South African Weather Service for three reception stations (LUTs): Gough Is., Marion Is., and SANAE (South African National Antarctic Expedition). In addition, CLS offered to upgrade the Cape Town LUT if SAWS ordered the 3 LUTs. For the moment, SAWS who should take a decision in 2008 is assessing the proposal.

3.1.8 Easter Island LUT:

No antenna, no infrastructure available.

3.2 Issues arising from the Argos Operations Committee

In 2006, during the DBCP22 meeting, a representative of CNES organized a discussion on the users and manufacturers' requirements for the Argos-4 instrument. This next generation should be installed for the first time onboard the first NPOESS satellite of NOAA, around 2013.

On September 7th, 2007, CNES and CLS will meet for a review of the Argos-4 mission specifications.

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ANNEX VI

REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS

1. Report and recommendations from the Operations Committee

41st Operations Committee (June 2007)

G-1-1. Report on JTA Meeting

Yves Tréglos, the chairperson of the JTA did not attend the meeting, but provided the following report in advance. Bill Woodward presented it.

The Operations Committee took note of the report on the 26th Meeting of the Argos Joint Tariff Agreement (La Jolla, CA, USA, 23-25 October 2006) and advice on future actions as appropriate.

Discussion:

1. The 26th meeting on the Argos JTA was held in La Jolla, Ca, USA, from 23 to 25 October 2006, at the kind invitation of the National Oceanic and Atmospheric Administration (NOAA) of the United States. Ten ROCs/ROs were represented at the meeting, together with CLS/Service Argos. The Joint Secretariat served the meeting for JCOMM, made up of IOC and WMO Secretariats.
2. A key issue during the meeting was that of the considerable increase in costs that the new tariff scheme induced for a few animal tracking programs. This had led CLS to provide the programs concerned with so-called "soft landing" assistance during 2006, on a case-by-case basis.
3. The issue was difficult to solve because the afore-mentioned increase in costs was mainly due to specific practices of a few ROCs, which had slightly differed from the general usage (for various reasons) and had resulted in particularly low costs for those programs in the past.
4. Since there was a need to give more thoughts to the issue, the meeting first agreed to continue to provide the 2006 “soft landings” through 2007, on an exceptional basis, with the clear understanding that all programs would move towards the agreed tariff structure over the course of the following years.
5. CLS presented a proposal to the effect that the rates used for those specific programs could converge towards a common rule amongst similar programs over a three -year period. Another charging algorithm was also suggested and proposed for evaluation.
6. The participants from animal tracking communities proposed that a form of "limited use service" (LUS) be reinstated across all animal tracking programs, with appropriate modifications, to resolve animal tracking tariff issues.
7. The meeting eventually:
    a. 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;
    b. requested CLS and participants from animal tracking communities to conduct a study and simulations on possible tariff adjustments based on the LUS concept, to be completed by early 2007. Should the outcome of the study and simulations be not acceptable to the JTA, then CLS would re-submit the "convergence" proposal. In any case, a final and definite decision should be taken at the 2007 JTA Meeting.

At the time this report was prepared (end of May 2007), CLS had conducted the required study, the animal tracking representatives responded with a counter proposal and analysis of the differences now underway.

8. In addition , the meeting reviewed the arrangements for large programs. It agreed to introduce a new B coefficient of 2 Euro for programs that used more than 1200 platform-

years per year, considering that this provision fully complied with the rules of the new tariff, and specifically taking into account the agreement by all concerned that they would pay along the agreed upon rules.

9. As foreseen at its 25th meeting (Buenos Aires, October 2005), the meeting noted that all categories of platforms would henceforward benefit from the time slot computation as of 1 January 2007.

10. With a view to look at the future of the JTA, the meeting was presented with a report on its history, made up of four "sheets" that:
    a. described the birth of the JTA;
    b. listed the JTA meetings since the inception;
    c. detailed, in a tabular form, what was to be highlighted in each JTA meetings;
    d. picked here and there elements and thoughts that were considered useful for the consideration of the future of the JTA. This last sheet represented a first attempt to illustrate how the past could more or less enlighten the future.

11. The meeting requested:
    a. to supplement the report with a review of the relationships between OPSCOM and the JTA, and
    b. to maintain the report as a dynamic document.

Since then, the chair, with the assistance of Chris O'Connors and Hester Viola, has taken steps to meet those requirements and may report that the work is close to completion.

12. In this connection, the meeting decided to establish a "permanent JTA review mechanism (Jrev)", with its terms-of-reference, membership and *modus operandi*.

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

G-1-2. Status of U.S. processing agreement

Mr. Eric Locklear, who is currently the U.S. Representative of Country (ROC), gave the report. Mr. Locklear reported on three sections, Highlights, Program Status, and Proposed Actions. With respect to highlights, Mr. Locklear reported about the success of the 2006 Joint Tariff Agreement (JTA) negotiations. It was successful for 2 reasons; the first is that costs for the users remained stable. He reported that large program users in the government have a difficult time adjusting to rapid changes in costs because of the long approval time it takes to get budgets approved by U.S. government officials. The second reason the meeting was successful was that the U.S. participation in the JTA was stabilized. Government participation in the JTA is voluntary; therefore, it is essential to maintain stability among the members to ensure continuity for the Argos program and its users.

In the program status section, Mr. Locklear reported that he conducted an informal survey of the U.S. users' satisfaction with Argos. The overall survey results were that the users continue to see Argos and CLS favourably serving their scientific needs. Mr. Locklear reported that the OPSCOM should expect to see much less growth in usage from the large U.S. users. These users have reached their goal in unit deployments, and moving into an operations and maintenance mode, out of deployment mode. Mr. Locklear then reported that the U.S. ROC's ability to transfer funds between U.S. government agencies has been under increasing legal scrutiny, causing delays in paying CLS for services already received. Lastly, Mr. Locklear reported that some users previously reported to have positive account balances actually had negative ones. The result is that securing funds to pay for these program user invoices is increasingly difficult.

In conclusion, The U.S. ROC has proposed two actions; the first is to seek increased legal authority to transfer funds from the National Science Foundation and the Office of Naval Research. This would allow for paying CLS invoices more timely for these user groups. The second action is for the U.S. ROC to seek funding to replenish the negative user accounts to make them positive.

G-1-5. Financial status of Agent (see exhibit # 25 & 25 bis)

Methodology to derive Argos costs to be attributed to the JTA:
Christophe Vassal presented the meeting with the CLS methodology to derive the Argos basic costs to be attributed to the JTA.
It showed that the Argos basic costs have slightly increased from 11.76 M€ to 12.24 M€ mainly because significant work had continued to be performed in 2006 to finalize the Argos ground segment for the next Argos generation to fly onboard MetOp-A launched in October 2006 and whose Argos payload was declared operational in May 2007. In addition, the cost to promote the use of Argos for fishing applications has increased due to the number of remote countries that are now willing to get a VMS.
In 2006, the costs to be attributed to the JTA are calculated at 6.38 M€.

Christophe Vassal recorded that 2006 was the first year of applying the new JTA tariff to all countries. At the 26th JTA meeting, the following was agreed:

- The Meeting recalled the 5-year plan presented in the 25th meeting, which contained expected revenue shortage in 2005 due to "soft landings", for certain, programs 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 clear understanding that all programs would move towards the agreed tariff structure over the course of the following years. Because, 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 Euros. This would allow existing most such programs to start reducing their B-rate from 9 Euros, while at the same time soft landing programs paying less than 6 Euros would gradually increase their contributions

- *Downlink tariff and high data rate channel policy*: Noting that MetOp-A would carry an Argos-3 instrument equipped with 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'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/CLS America proposed to grant free access to these new services for a one- year period.

In 2006, CLS recorded revenues from JTA countries at a level of 6.31 M€. This was slightly different from the revenues expected from the JTA at 6.83 M€. This shortage in revenue is explained by two factors:

- "Soft landings" provided for user programs tracking marine animals at a level of 0.45 M€,
- Revenue above the large program fixed price, at a level of 0.35 M€.

So in 2006, the JTA is going to expect a small loss of 0.07 M€ which will be compensated by the 2005 excess of 0.31 M€.

The non-JTA incomes increased significantly in 2006 from 7.04 M€ to 7.36 M€ slightly exceeding their portion of the costs.

Consequently, the non-JTA accumulated loss at the end of 2006 is calculated at 7.41 M€.

At the date of this meeting, we believe the JTA in 2007 may cover its portion of the costs with all countries having adopted the new tariff scheme and the US large program contributing to the cost on a per usage basis, with a new discount rate agreed upon by the last meeting of the JTA to accommodate programs consuming more than 1200 ptt -years.

However, two uncertainties remain with regard to the JTA income in 2007:

- The impact of the fact that all categories of platforms, including drifting buoys will benefit from 2007 and onward from the time slot calculation
- The impact of the significant program of accommodation through soft landings that CLS/CLS America may continue to provide to several marine animal programs.

The OPSCOM co-chairmen thanked Christophe Vassal for the clear presentation of the Argos financial situation but requested that the presentation be submitted to them not less than ten days in advance before future OPSCOM meetings.

2. The 2005-2009 Year Operating Plan

The 5 Year plan table updated with actual 2006 and projected 2007 numbers is provided below.

Extrapolation Jan-Aug 07

In euro	2005 Actual	2006	2007 Extrap. Aug.	2008	2009
JTA Costs (M€)					
cost increase %	2.0%	2.0%	2.0%	2.0%	2.0%
Actual & Forecast	6.13	6.38	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%*	*4%*	*2%*	*2%*
Growth PTT-yrs (%)	*20%*	*10%*	*-6%*	*2%*	*2%*
Active Ptfs (Total)	*7720*	*8768*	*9156*	*9122*	*9304*
PTT-yrs (Total)	*2852*	*3140*	*2952*	*3266*	*3332*
Active PTTs (w/o large program)	*5244*	*5910*	*6057*	6149	6272
PTT-yrs (Buoys & Others)	*682*	*663*	*608*	*690*	*703*
PTT-yrs (floats w/o large pgm)	*105*	*117*	*87*	*122*	*125*
PTT-yrs (Animal)	*580*	*630*	*656*	*656*	*669*
PTT-yrs (Fixed stations)	*156*	*149*	*134*	*155*	*158*
Active PTTs (large pgm)	*2476*	*2858*	*3099*	*2973*	*3033*
PTT-yrs (large pgm) Buoys & Others	*1258*	*1495*	*1356*	*1520*	*1596*
PTT-yrs (large pgm) Floats	*71*	*85*	*110*	*88*	*90*
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	1.06	1.09	1.11	1.13
Day unit income (M€)	3.91	4.07	3.92	4.24	4.32
Total Large pgm (M€)	1.94	1.70	1.67	1.74	1.81
Total basic service expected (M€)	**6.80**	**6.83**	**6.68**	**7.08**	**7.26**
Additional revenue	**0.14**	**0.14**	**0.15**	**0.10**	**0.05**
Revenue shortage					
Former JTA - CA, CN, UK	0.15	0	0		
Soft Landings (or Animal price capping from 08	0.26	0.31	0.35	0.34	0.1
Revenue above Large Program Fixed price	0.59	0.35	0.00		
Total Actual basic service (M€)	**5.94**	**6.31**	**6.48**	**6.84**	**7.21**
Year Balance	-0.19	-0.07	-0.12	0.11	0.34
Carried forward from previous year	0.50	0.31	0.24	0.12	0.23
Cumulated Balance	0.31	0.24	0.12	0.23	0.57

3. Financial Statement

3.1 Annual Expenses (in Euros) for Year 2006

		Personnel	Costs	Amortization	Total
Management		***657***	***465***		***1 122***
Operational costs					
	Quality	210	15	0	225
	Studies & development	602	131	255	988
	Processing center	1 851	182	225	2 259
	Client support/customer service	963	565	0	1 528
Sub-total Operational		***3 626***	***893***	***481***	***5 000***
Marketing costs					
	Promotion Communication	1 139	694	11	1 844
	Travels, hosting	0	529	0	529
Sub-Total Marketing		***1 139***	***1 222***	***11***	***2 372***
Administrative costs					
	Administration, finance, audit	1 153	420	14	1 588
	Costs for presence	81	929	108	1 118
Sub-Total Administrative		***1 234***	***1 349***	***122***	***2 705***
Taxes, bad debts provision & financial costs					
	Taxes		276		276
	Financial costs		556		556
	Provisons		211		211
Sub-Total		***0***	***1 042***	***0***	***1 042***
Total		**6 656**	**4 972**	**613**	**12 241**

Table 3.1: Detail on 2006 Expenses in k€

3.2 Details of Amortization Items

	Amortization	Description
Operational costs		
Quality	0	
Studies & development	255	*GTS, SSA3, Argos 2001*
Processing centre	225	*Maintenance processing centre (hardware and software)*
Sub-total	**481**	
Marketing costs		
Promotion	3	*Exhibit, International meetings, User Conference Costs*
Communication	8	*Exhibit, documentation Costs*
Sub-total	**11**	
Administrative costs		
Management control	14	*Accounting system, Argos registered mark*
Costs for presence	108	*Office furniture, safety, general equipment*
Sub-total	**122**	
Total	**613**	

Table 3.2: Detail of Amortization Items in k€

3.3 Annual Incomes (in millions of Euros)

Incomes (M€)	**2005**	**2006**
JTA	5.94	6.31
Non JTA	7.04	7.36
Total	12.98	13.67

Table 3.3: JTA and non JTA 2005, 2006 Incomes

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

	2005	2006	
Incomes			
JTA CLS	2.00	2.44	
JTA SAI	3.94	3.87	
	5.94	**6.31**	**+6.26%**
Non JTA CLS	6.51	6.58	
Non JTA SAI	0.54	0.78	
	7.04	**7.36**	
Total basic Argos incomes	**12.98**	**13.67**	**+5.28%**
Expenses			
Total basic Argos expenses	**11.76**	**12.24**	**+4.06%**

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

3.5 JTA Annual Balance (in millions of Euros)

	2005	2006
JTA Operating Costs*	6.13	6.38
JTA Income	5.94	6.31
Difference	-0.19	-0.07
Accumulated Difference	0.30	0.37

* The remaining difference from 2004 was 0.30 M€.

Table 3.5: Annual Balance

For year 2006, the costs to be attributed to the JTA, calculated using the methodology developed by CLS science 3 years now, is 6.38 M€.

4. Other Issues Relating to Argos Funding

4.1 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 2007 there were 29 892 ID (27 472 in Aug. 2006) numbers allocated to JTA applications out of which some 76% (against 69% last year) – 22 614 IDs - were 28 bit. Though the situation is improving, there is still a fair amount of 20 bit IDs in JTA programs (7 278 IDs) thus we strongly encourage to proceed with a mechanism to recover the ID numbers.

It is to be noted that some 5% of the Unused Id invoices are never recovered. This happens essentially when user has stopped his program and the invoices sent only include the unused ID charges. In such cases of stopped experiments, the administrative work to track and recover the invoices is often quite significant. The duration of two years before the start of the unused ID invoicing is long and the users have often shifted to other projects, sometimes even moved to another organization, and the dedicated budget has vanished.

A possible alternative to charging Unused ID fees is to implement a minor ID charge for all IDs in a program. The advantages foreseen are:

i) this is an incentive for the user to efficiently manage his IDs during the lifetime of his program,
ii) the ID invoice acts as a swift reminder to the owner of a stopped program to release the IDs. It is received no later than two months after the end of the experiment.

4.2 Time slot accounting for all PTTS

As agreed at the JTA XXVI, the time slot accounting was extended for 2007 to all Argos platform categories. The financial loss for 2006 was 109 k€ and is projected to 85 k€ for 2007.

4.3 Marine Animal tariff structure adjustment

Further to the requirements of the animal trackers representatives at the JTA XXVI, CLS was asked by the meeting to perform a simulation study to evaluate the possibility to introduce a form of price capping to be applied to <u>all</u> the animals. The study and the related discussions with the animal tracker representative are detailed in Annex IX.

As a result, the following agreement was reached between CLS and the animal tracker representatives:

- the current Argos monthly charge – A + B x day units, (A = 15 € and B = 9 €) will be capped to a maximum of 12 day units. As a consequence, the tariff remains unchanged for all animals which produce less than 12 day units (48 6-hours time slots) per month and is fixed to (15 + 9 x 12) = 123 € for the others "top performers".

The intention of this pricing adjustment is to develop science applications and encourage the biologists to use the system as much as they need, for a maximum fixed price. This also helps

relaxing the transmitter setting constraints, which will be mainly driven by the mission itself and the battery autonomy, rather than service price considerations.

It is recalled that this pricing is defined for, and only applies to animal categories, which, as recalled in the minutes of the JTA XXVI, are affected by a significantly lower transmission performance in comparison with the other Argos applications.

This tariff adjustment will be reviewed at the JTAXXVII and considered for approval.

4.4 Inactive Status service

Since year 2004, transmissions from IDs in inactive status are no longer charged. Yet, as shown in Chapter 1, in 2007, there are some 350-400 PTTs in inactive status and the related projected consumption is 250 PTT-years. This significant number of PTTs participates to the system occupancy and can bring some competition to the operational transmitters in normal service. These are most frequently autonomous expendable transmitters with large batteries (drifters) and/or solar panels (animal tags). Thanks to the PMTs and the Argos two-way, it will be possible in the near future to stop the transmissions when they are no longer needed. To regulate the increase of PTTs in inactive status and the related system occupancy, it is wise to consider levying a charge that will discourage the transmissions after the end of the experiment. This will be discussed at the JTA meeting.

4.5 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 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.
The new Argos Web site was implemented in September 2006. Web pages dedicated to manufacturers have been designed. They include specific documentation and frequency distribution display all around the world. Further to the signature of a dedicated NDA (non-disclosure agreement), the web pages are being opened to manufacturers.

4.6 Downlink tariff and high data rate channel policy

METOP 1, which carries an Argos-3 instrument, equipped with a downlink capability and the 4.8 kbps high data rate channel, was launched on 19th October 2006.
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 €.
To foster the test and use of these new capabilities, CLS keeps with the proposal to grant free access to these new services for a one-year period.

4.7 Processing Iridium data

In January 2007, CLS became a global Iridium VAR (Value Added Reseller) for the Iridium modems and data service.
Since 2006, CLS America has been processing for GTS dissemination the Iridium data from ARGO floats deployed by the University of Washington.

In parallel, CLS has developed an Iridium server and a database, which is to be linked to the Argos operational database. As pilot step, data from two Iridium drifters are being inserted in the Argos Development database and GTS processing is being tested.
The pricing structure for Iridium transmissions and service is being studied. Main guidelines should be presented and discussed at the JTA.

5. Development Projects of the Argos System

These projects are presented in three categories:

5.1. 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
Argos 2001 project (Argos processing system renewal) step 3A (without observations and GTS processing)

5.2. Projects Being Developed (or which started in 2006)

Argos 2001 project (Argos processing system renewal) step 3B (with observations and GTS processing)
GTS Subsystem adjustments 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 Centre upgrade and related web interface
Implementation of METOP compatible network of LUT antennas (ongoing)
Processing Iridium data (step 1)
Argos Web evolutions (ongoing)

5.3. Projects under study

Argos 4 instrument
Processing Iridium data (step 2)

ANNEX VII

ROLE OF THE JTA REPRESENTATIVE OF COUNTRY (ROC)
(draft)

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

The Representative of Country (ROC) is the person representing a country or a group of countries from a responsible government organization. The ROC is the Responsible Authority representing an agreed set of Argos User Programs for the purposes of their collective participation in the JTA.

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

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

NOMINATION AND REGOGNITION OF ROC
Process to be defined.

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

ROC ROLES – CLS/ARGOS INTERFACE
- Tariff charge rate negotiation – Review CLS/ Argos financial analyses, and approve the level of expenses to be attributed to JTA user programs support. Negotiate tariff structures that will fund the costs of the JTA service, to achieve globally consistent, predictable and equitable service pricing arrangements for all user classes (i.e. across the range of environmental science applications).
- High-level advocacy of user programs and user service classes. Provide high-level collective advocacy of all user programs and user service classes to CLS/Argos to assure long-term stability of the environmental data service for all end user service classes, and effective management of service or charge rate transitions.
- Representation of user requirements. Represent user requirements (current service shortcomings, enhancements and future requirements) to CLS/Argos, as a basis for prioritising system corrective actions, enhancements or strategic investments.
- Endorsement of service investments. Review and endorse investments needed to sustain and enhance the CLS/Argos provision of basic services, and ensure the forward funding basis for such investments.
- Provision of independent advice to end users. Represent CLS/Argos service capabilities to end users (existing or candidate) and provide limited support to enable users to make appropriate decisions, and to resolve service problems. Support may be in the form of

technical advice, referral to peer programs, etc. It is to be provided in the context of existing primary support through equipment suppliers and CLS/Argos channels, not as an alternative to those arrangements.

- Adjudication of JTA program eligibility. On referral from CLS/Argos, adjudicate the eligibility of new user programs for inclusion in the JTA.
- Submission of a National Report to the JTA Meeting. Provide a National Report to the JTA meeting, at least one month prior to the meeting. The content shall follow the current report guidance.
- Attendance at JTA meetings. ROCs are expected to attend JTA meetings. Alternatively, they are to consider the materials circulated prior to the JTA meeting, and to ensure that the interests of the user programs they represent are adequately conveyed through a ROC who will be attending the meeting, or else through their National Report.

Enabling Actions to Support the ROC's Role

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

Issues

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

ROC ROLES – INTERFACE WITH END USER PROGRAMS

ROC's provide the following value to end users:

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

ROC ROLES – SUPPLIER INTERACTIONS

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

Enabling Actions to Support the ROC's Role

- CLS/Argos is to ensure suppliers are familiar with the ROC's role, and to encourage supplier contact with ROCs.
- CLS/Argos is to facilitate ROC / supplier interactions, e.g. by invitation to user-supplier forums organised by CLS/Argos.

ROC ROLE – OPSCOM RELATIONSHIP

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

ROC – ROC RELATIONSHIP

- *To be developed.*

ANNEX VIII

TERMS AND CONDITIONS OF THE GLOBAL AGREEMENT FOR 2008

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

TIME PERIOD OF COVERAGE:

These Terms and Conditions are valid for the time period beginning on **January 1 and ending on December 31, 2008.**

DEFINITIONS

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

“ROC” is the Representative of Country representing a country or a group of countries participating in the JTA.

“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 listed in Annex A to this Agreement.

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

BASIC SERVICES PROVIDED BY CLS

CLS will perform the following categories of services associated with PTTs of the authorized users:

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

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

(3) Location service plus / auxiliary location

(4) On-line data access

(5) GTS Processing and Distribution

USER BASIC SERVICE CHARGES

BASIC SERVICE

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

They are calculated according to the following formula:

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 unit rate.

- **n** is the number of day units. The day is divided into 4 time slots (0 - 6; 6 - 12; 12 - 18; 18 – 24 UTC). Any PTT transmission collected into a given time slot produces a 0.25-day unit. .

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

Category	A (€)	B (€)
Buoys and others	15	6
Fixed Stations	15	3
Animals*	15	9
Subsurface Floats	15	9

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

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

Animals – PTTs in this category are those that are used to track animals.
*Charges for Platforms in this category will be capped at n=12 Day Units per month.

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

DISCOUNT SCHEME FOR LARGE PROGRAMMES

Number of platforms 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.
The purpose of this fee is to recover IDs no longer required.

INACTIVE STATUS

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

(1) Inactive Status will apply if, and only if, Inactive Status is declared by the signatory of the System Use Agreement for platforms, which continue to transmit beyond the programme termination. In that case, further charges will no longer be levied;

(2) The platforms must have operated in Basic Service for a minimum of 2 months;

(3) Data or location information cannot be retrieved nor can the platform revert to any category of service;

(4) It is intended that Location and/or data collection may not be computed using a Local User Terminal or other direct readout facility;

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

ADDITIONAL SERVICES PROVIDED BY CLS AND NOT INCLUDED IN BASIC SERVICES

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

DISTRIBUTION OF PROCESSED DATA

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

BILLING AND PAYMENT

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

GENERAL CONDITIONS OF AGREEMENT

(1) The designated ROC / RO and CLS jointly agree the list of users included in the Agreement and will update this list as appropriate. To assist in the process CLS will notify the ROC/RO of any new programmes that might qualify for this agreement.
(2) For additional services not provided within this Agreement, individual users under this Agreement must negotiate directly with CLS. Payments associated with these negotiations must be settled on receipt of the invoice. If these conditions are not met, CLS may stop the distribution of the user's processed data.

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

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

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

Signed on behalf of the participating countries by the JTA Chairperson Yves Tréglos	25 /03 /08	Signed by CLS Chief Executive Officer Christophe VASSAL	02/04 /08

Annex A

List of Countries participating in the 2008 Terms and Conditions of the JTA

AUSTRALIA*
AUSTRIA
BRAZIL
CANADA*
CHILE
CHINA*
DENMARK
EUROPE (E-SURFMAR)
FINLAND
FRANCE
GERMANY
INDIA
ITALY
KOREA, REPUBLIC OF*
NETHERLANDS*
NEW ZEALAND*
NORWAY
SOUTH AFRICA
SPAIN
SWEDEN
SWITZERLAND
UNITED ARAB EMIRATES*
UNITED KINGDOM*
UNITED STATES*
OTHER

* ROC present at JTA-XXVII

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ANNEX IX

DETAILED REPORT BY CLS WITH THE AGREEMENT BETWEEN CLS AND ANIMAL TRACKERS

1. Executive Summary

At JTA-26, La Jolla, California, CLS was requested to conduct by early 2007 a tariff simulation study:

"…….the participants from animal tracking communities proposed that a form of limited use service (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…"

"…..the Meeting 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, the final and definite decision should be taken at the 2007 JTA Meeting."

CLS conducted the simulation in March 2007. Using all available historical information the study showed that:

1. Income actually received in 2006 from all animal programs was 2.40 M€
2. Income from all animal programs that would have been received in 2006 if the old tariff had still been in place was 2.46 to 2.55+ M€
3. Income that could be generated by applying: i) LUS threshold of 10 day-units (40 time slots), ii) A = 15 € and, iii) B = 10 € to 2006 animal program usage is 2.39 M€.
4. Other combinations of LUS threshold, and B values were also simulated by applying them to 2006 animal program usage resulting in a range of possible income from 1.51 M€ to 3.38 M€

The simulation table showing possible incomes versus different B coefficients and LUS thresholds was delivered to the four animal tracking representatives on March 21, 2007. It was indicated at that time that in order for CLS to incur no additional loss in income a desired target income was 2.40 M€.

An initial response from the animal tracking representatives (letter from Mike Fedak, Annex 2) proposed: ***A = 15 Euros, B = 8 Euros, Monthly Cap = 10days (i.e. 40 6-hr time slots*)**. This was rejected by CLS as being not financially prudent given the considerable losses that would result. This prompted a second response from the animal tracking representatives, which proposed two alternative charging solutions:

a) Capped Monthly fee
A (monthly fee) = 15 Euros
B (daily rate) = 9Euros

Monthly Cap = 12 day-units (i.e. 48 6-hr time slots)

b) Monthly flat rate
A (monthly fee) = 58 Euros
B (daily rate) = 0 Euros

The simulation table generated by CLS illustrates that these options result in incomes of 2.32 M€ and 2.40 M€ for a) and b) respectively. It can be noted that option a) has no negative impact on the majority of the animal tracker programs but does result in a global revenue loss to the JTA of 80 k€. Option b) is simple and revenue neutral but introduces a significant increase in cost for the majority of the animal trackers.

CLS favours the option a) above, proposed by the animal tracker representatives, provided i) the revenue loss can be compensated, and ii) such charging method is solely applied to the animal tracker programs in compensation for their lower number of transmissions compared to the other Argos platforms.

On September 21, Phil Lovell (SMRU) speaking for the Animal tracking representatives e-mailed the following:

« If we need to present a single preferred option I think it should be solution "B". That is A=15, B=9, cap=12 for all animals. The benefits of this are: simplicity: the same A and B rates as the standard tariff, it applies to all animals, no need to argue whether or not a particular species is "marine", it does not increase the charge for very low usage tags (unlike option "C" or the various modifications to the A rate). I think this addresses the main concerns of all sides, and so it has the best chance of finding agreement at the meeting. »

The above text illustrates that, agreement has been reached between CLS and the Animal Tracking Representatives on a pricing scenario for all animals of: ***A=15€, B=9€, Monthly Cap = 12 Day Units (i.e. 48, 6-hr time slots)***

CLS acknowledges that the final decision will be taken at the JTA-27 meeting in Jeju, Korea. If no agreement can be reached at the meeting then the CLS JTA-26 proposal to converge the B-rate, for marine animal programs only, to a new lower rate of 6€, will be adopted.

2. The Simulation Study Request from the JTA 26 Meeting

Excerpt from the JTA 26 Final Report:

> *"TARIFF ISSUES CONCERNING MARINE ANIMAL TRACKING*
>
> *6.1 The Meeting recalled that, in 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, compare to the old LUS tariff, the*

new tariff structure of 6-hourly time slots has resulted in a substantial increase in the cost incurred, therefore, it impacted severely relevant scientific research programmes.

6.2 In this context, the participants from animal tracking communities proposed that a form of limited use service (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 under the following initial guidelines, given the relatively low bandwidth used by their PTTs. A proposal made by the participants from animal tracking communities is reproduced in Annex IX.

6.3 The Meeting considered that the new tariff structure globally applied from 2006 was convenient for 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.

6.4 After the discussion, the Meeting 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, the final and definite decision should be taken at the 2007 JTA Meeting."

(end of excerpt from the JTA 26 Final Report)

Excerpt from the JTA 26 Final Report, Annex IX (prepared by the Animal Tracking Representatives):

"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."

(end of excerpt from the JTA 26 Final Report, Annex IX)

3. The Team at Work

CLS Team:

- Bill Woodward
- Seema Owen
- Christian Ortega
- Philippe Gros

The CLS team provided the JTA usage numbers and performed the simulations.

UK ROC

- David Meldrum, the UK ROC, liaised with the UK animal tracking community. He took the opportunity of a visit to Toulouse on March 21st to work with the CLS team on simulations and to help with the presentation of the results (see Table 1 below). With CLS agreement, he submitted the results to the animal tracking representatives, saying, "…we need to come up with numbers that produce an income somewhere in the CLS comfort zone of, say, 2.3 to 2.5 M€"
- He also participated in a teleconference with the animal tracking representatives at the SMRU in St Andrews, on May 18th as well as conducting additional continuing simulations

The Animal Tracking Representatives

- Pierre Richard, Department of Fisheries and Oceans, Canada
- Don Bowen, Department of Fisheries and Oceans, Canada
- David Douglas, USGS Alaska Science Centre, US
- Mike Fedak, Sea Mammal Research Unit, Scotland

Also in attendance at the teleconference on May 18th were

- Bernie McConnell, Sea Mammal Research Unit, Scotland
- Phil Lovell, Sea Mammal Research Unit, Scotland

4. The Simulation Study

The simulation study was performed in accordance with the specific request from the animal tracking representatives, which is defined in the following excerpt from Annex IX of the JTA 26 Final Report:

> **"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 Euros and B=9 Euros;**
> 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 with 10-ptt-day per month threshold.**

4.1 Simulation procedure

For 2006 usage numbers:

The goal was to evaluate the impact on the JTA revenue of applying a "ten day-unit" (or 40 time slots) monthly capping to the actual 2006 usage numbers for all animal programs and to study possible adjustments on the "B" coefficient rate or the monthly capping threshold itself. Thus, the simulation parameters are the monthly capping threshold in day units and the "B" rate.

Table 1. Below documents the results of the simulation and illustrates the range of possible revenue that would result if various combinations of caps and "B" coefficient rates were applied to the 2006 actual consumption numbers.

The real revenue that was actually collected from all animal programs in all countries in 2006 was 2.40 M€. This amount includes the application of "soft-landing" discounts to some US, Canada and UK programs (that is, the revenue actually collected would have been higher by 0.23 M€ if the discounts had not been applied). Using this number as a viable revenue target, the table below shows a "comfort" zone highlighted in yellow, that the simulation showed could be achieved by applying several different combinations of caps and "B" coefficient.

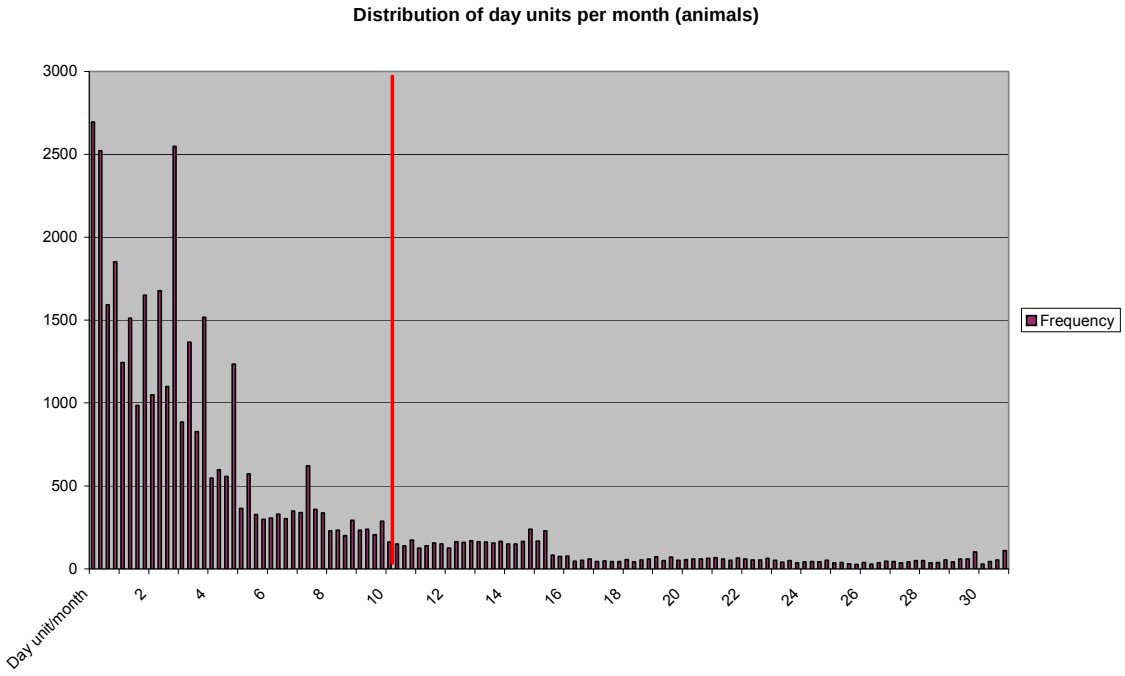
A = 15								
B(€)->	5	6	7	8	9	10	11	12
Max day-units								
0.0	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
2.5								
5.0			1.51	1.64	1.77	1.90	2.02	2.15
7.5				1.87	2.03	2.18	2.34	2.50
10.0		1.68	1.86	2.03	2.21	**2.39**	2.56	
12.0			1.94	2.13	**2.32**	2.51		
12.5			1.96	2.16	2.35	2.54		
15.0			2.04	2.25	2.45	2.65		
17.5				2.31	2.52			
20.0				2.36	2.58			
22.5				2.40				
25.0			2.20	2.43	2.65			
27.5								
30.0	1.77		2.23					3.38

Table 7 – Simulation results

It can be seen, for example, that with a cap at 10 day-units (40 time slots) and B = 10€, the possible income for 2006 would be 2.39 M€. With a cap at 12 day-units (48 time slots) and B = 9 €, the income for 2006 would be 2.32 M€.

Additional analysis of the actual 2006 consumption:

The diagram below displays the distributions of actual day-units per month consumed in 2006 by all animal programs.



It can be seen that the large majority of animal applications will not benefit from the price capping. Still a significant number of PTTs would see a price decrease.

<u>For 2005 Pricing/Usage Numbers:</u>

The next step in the simulation was to apply the 2005 tariff pricing structure to the 2006 animal tracking consumption numbers to assess what revenue would have been received under the old tariff.

This, however, is a very complex and not very relevant exercise because in 2005 we had two separate pricing structures since all countries except the UK, Canada, and China were already using the new tariff structure.

We therefore found it necessary to go back to the 2004 pricing structure since that was the last year that all countries were subject to the same pricing structure. However, this situation is also quite complex. This is because even though the pricing structure for 2004 was clear at the JTA level, the price that was actually charged to the users differed by country and was dependent on several variables including:

- The actual level of bonus enjoyed by the country (level of bonus allocated and level of bonus actually used, which depended on the total consumption of the country above their contracted number),
- The ROC policy for the distribution of the bonus in the country,
- The actual implementation of the Active monthly fee at the level of the user: e.g., Canada, UK and US ROCs didn't even apply this charge to their users,
- The administrative fee collected by the ROCs,
- The number of animal programs that were in LUS – (not all animal programs were in LUS).

Due to the above complexities, we found it necessary to apply some assumptions in order to make this 2004 pricing structure simulation tractable. The assumptions were: i) that all animal programs in 2004 were in LUS, - which was not the case - only a percentage of them were in LUS, and ii) that the actual average level of bonus was 34.44%.*

Using these assumptions, the total income that would have been brought by the animal community in 2006, under the old tariff was calculated and shown below in Table 2.

	Simulated 2006 Revenue Using 2004 Tariff (M€)
30% bonus	**2.55**
35% bonus	**2.46**
40% bonus	**2.39**

Table 2. Simulation Results 2004/2006

** This is supported by the following elements:*
a) USA represents about 60% of the total JTA wildlife activity, getting an average bonus of 26.4%.
b) Canada represents about 20% of the total JTA wildlife activity and got 35% bonus.
c) UK represents about 5% of the total JTA wildlife activity and got 82% bonus.
d) The rest (15%) of the programs got an average of 50% bonus.

Thus, the average bonus was:

0.6x26.4 + 0.2x35 + 0.05x82 + 0.15x50 = 15.84 + 7 + 4.1 + 7.5 = 34.44%

4.2 Animal Tracking Representative Response

The first response of the animal tracking representatives is provided in their letter dated May 23 2007, signed by Mike Fedak attached to this report as Annex 2. An excerpt from that letter is:

> *"Recognizing the positive spirit of the most recent tariff negotiations, and the willingness by CLS to converge animal tracking rates towards those enjoyed by the rest of the community, we propose that the charging algorithm, for all animal trackers, for 2008 be:*
>
> *A (monthly rental) = 15 Euros*
> *B (daily rate, charged B/4 per 6-hr time unit) = 8 Euros*
> *Monthly cap = 10 days (i.e. 40 6-hr time units)*

On September 14, 2007, the animal tracking representatives - provided in annex 1 with accompanying text below, proposed a second set of scenarios:

Here is "…. a summary of the scenarios we have been considering. Our concern as animal trackers is to achieve the best quality tracks that are possible within the technical limitations of the system. We are dissatisfied with the CLS proposal – i.e. B = 6 € for Marine Animals - because it discourages those who try to do this.

Following consultation with other users, we strongly prefer the following options from the document provided in annex 1:

Option F: A= 58 €, B=0 €
Option B: A=15 €, B=9 €, with a cap of 12 day-units/month for all animals.

We believe that both of these options provide an equitable tariff across all animal users, and also maintain revenue for CLS close to the target levels."

5. CLS Review of The Animal Tracking Representatives Proposals

Table 3 summarizes the results of the study conducted by CLS, based on 2006 consumptions, for 4 situations:

A. Revenue based on applying 2004 tariff structure to 2006 consumption numbers, with the following assumptions:
   1) All animal programs are in LUS, which was not the case, only a percentage was.
   2) The actual average level of bonus was 34.44%.

B. Actual 2006 revenue collected from all animal programs
C. Income based on CLS proposal presented at JTA26 (B= 6 € for all marine animals and the rest unchanged)
D. Income based on LUS on day-units, 10 days (40 time slots) and B = 10 €.

	A.	B.	C.	D.
	Old tariff (M€)	Actual 2006 (M€)	CLS Proposal	New LUS
30% bonus	**2.55**			
35% bonus	**2.46**	**2.40**	**2.40**	**2.39**
40% bonus	**2.39**			

Table 3. Simulation Summary

The May 23rd proposal by the animal tracking representatives – monthly capping at 10 day units and B coefficient at 8 € - as described in Section 4 above, would generate a revenue of 2.03 M€ (see Table 1) if applied to the 2006 animal program consumption numbers. This represents a revenue shortage of ~ 0.4 M€ compared to the actual 2006 revenue, and a total shortage of ~ 0.6 M€ if soft landing discounts are added. Thus, this solution has a significantly negative impact on the JTA total revenue.

In view of the JTA revenue evolution and in particular of the anticipated revenue losses related to Iridium competition on ocean applications, CLS believes that it is essential for the JTA to maintain at least the level of 2006 revenue.

Consequently, CLS believes that this May 23rd proposal is not a financially prudent solution and therefore does not support this proposal.

Regarding the September 14 proposal, the simulation table generated by CLS illustrates that these options result in incomes of 2.32 M€ and 2.40 M€ for a) and b) respectively. It can be noted that option a) has no negative impact on the majority of the animal tracker programs but does result in a global revenue loss to the JTA of 80 k€. Option b) is simple and revenue neutral but introduces a significant increase in cost for the majority of the animal trackers.

CLS favours the option a) proposed by the animal tracker representatives, ***A=15 €, B=9 €, with a cap of 12 day-units/month for all animals,*** provided i) the revenue loss can be compensated, and ii) such charging method is solely applied to the animal tracker

programs as compensation for their lower number of transmissions compared to the other Argos platforms.

On September 21, Phil Lovell (SMRU) speaking for the Animal tracking representatives e-mailed the following:

> *« If we need to present a single preferred option I think it should be solution "B". That is A=15, B=9, cap=12 for all animals. The benefits of this are: simplicity: the same A and B rates as the standard tariff; it applies to all animals: no need to argue whether or not a particular species is "marine"; it does not increase the charge for very low usage tags (unlike option "C" or the various modifications to the A rate).*
>
> *I think this addresses the main concerns of all sides, and so it has the best chance of finding agreement at the meeting. »*

The above text illustrates that, agreement has been reached between CLS and the Animal Tracking Representatives on a pricing scenario for all animals of: ***A=15€, B=9€, Monthly Cap = 12 Day Units (i.e. 48, 6-hr time slots)***

CLS acknowledges that the final decision will be taken at the JTA-27 meeting in Jeju, Korea. If no agreement can be reached at the meeting then the CLS JTA-26 proposal to converge the B-rate, for marine animal programs only, to a new lower rate of 6€, will be adopted.

Annex 1 – Scenario summary

		Marine			Non-marine			1 CLS income	2 Notes
	Duty cycle:	*10%*	*25%*	*100%*	*10%*	*25%*	*100%*	M€	
	CLS proposal (B=6 marine only; no cap)	33	60	195	42	83	285	2.40	Penalises best-performing marine tags, no help for non-marine tags.
	Animal Trackers' proposal (B=8; cap=10 for all animals)	39	75	95	39	75	95	2.03	Insufficient income for CLS.
A	B=9; cap=10 for all animals	42	83	105	42	83	105	2.20	Standard B rate. Still insufficient income for CLS?
B	B=9; cap=12 for all animals	42	83	123	42	83	123	2.32	Standard B rate.
C	B=10; cap=10 for all animals	45	90	115	45	90	115	2.39	Achieves CLS revenue target, but it may be impractical to have a higher B rate than standard.
D	B=9; cap=10 for marine animals, cap=20 for non-marine animals	42	83	105	42	83	195	2.42	Achieves CLS revenue target. Standard B rate. Most favourable to marine tags, but gives some help to improve non-marine tracks.
E	B=8; cap=10 for marine animals, no cap for non-marine animals	39	75	95	42	83	285	2.41	Achieves CLS revenue target. No help to non-marine tags.
F	B=0 flat monthly fee for all	58	58	58	58	58	58	2.40	Achieves CLS revenue target. Simplifies project budgeting. Favours

animals				marine tags with greater than 15% duty cycle and non-marine tags with >25% duty-cycle.

Annex 2 – Letter

Sea Mammal Research Unit

Gatty Marine Laboratory
University of St Andrews
St Andrews
Fife KY16 8LB
Scotland UK

General Office: Tel . No. 01334 462630
Fax. No. 01334 462632

Professor I.L. Boyd (Director)
Professor M.A. Fedak
Professor J. Harwood

23 May, 2007

Christian Ortega
CLS Argos
8-10, rue Hermès,
Parc Technologique du Canal
31520 Ramonville Saint-Agne
France

Dear Christian,

We have just held a telephone conference to discuss Argos Animal Tracker Representatives' view of the JTA charging formula as it applies to the entire animal tracking community. The four Representatives present were:

Pierre Richard, Department of Fisheries and Oceans, Canada
Don Bowen, Department of Fisheries and Oceans, Canada
David Douglas, USGS Alaska Science Center, US and
Mike Fedak, Sea Mammal Research Unit, Scotland

Also in attendance were

Bernie McConnell, Sea Mammal Research Unit, Scotland
Phil Lovell, Sea Mammal Research Unit, Scotland and
David Meldrum, SAMS, Oban, Scotland.

1. We noted the great variety of national JTA agreements for animal trackers and acknowledged the need to simplify and stabilise the charging formula.
2. We reasserted our view that the natural charging system should be based on the amount of data successfully relayed via Argos and spread proportionately across all user groups.
3. Recognising the positive spirit of the most recent tariff negotiations, and the willingness by CLS to converge animal tracking rates towards those enjoyed by the rest of the community, we propose that the charging algorithm, for all animal trackers, for 2008 be:

A (monthly rental) = 15 Euros
B (daily rate, charged B/4 per 6-hr time unit) = 8 Euros
Monthly cap = 10 days (i.e. 40 6-hr time units)

All present were agreed (reluctantly) that this was an acceptable "short term" option (i.e., until the next JTA tariff review) and that by agreeing to it we should not put aside the need to search for a fair alternative arrangement based on the real costs to the system of using it. We all felt that a first step in

developing such a charging algorithm was to establish an overall cost per message based on total system use and total revenues.

David Meldrum presented his analysis (as presented at the 2006 JTA) of relative charges across user groups for the benefit of those attending who had not seen it. Two important observations emerged and were accepted from this:

1) that all animal trackers should be treated as one group of users. They have similar system occupancy characteristics, and share the same constraints related to power and the need for evenly spaced locations over time (even if in the case of diving animals, an additional non-additive constraint acts to limit bandwidth)
2) that animal trackers as a whole (i.e. not just diving marine animals) were all being charged far above (by a factor >10) the rate charged to other groups by current schemes and that minor tweaks to these were not likely to generate a generally fair approach in the future. A fresh look would have to be taken at costs across the board.

So while the suggested algorithm may be useful as a temporary solution, a more general tariff should be sought that would treat all users more fairly based on system usage.

We welcome the invitation by CLS to engage in this debate, and, having consulted widely within the animal tracking community, believe that the views expressed above represent, for the first time, a consensus position across that community.

Sincerely

Mike Fedak (on behalf of all present)

NATURAL ENVIRONMENT RESEARCH COUNCIL

University of St Andrews

ANNEX X

NEW FORMAT FOR THE NATIONAL REPORTS TO THE JTA

Year:
Country:

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

Section 1. Overall Summary

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

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

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

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

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

Section 3. Technological Changes that Affect User Requirements

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

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

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

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

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

Section 6. Analysis of Local Operational Issues

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

ANNEX XI

NATIONAL REPORTS ON CURRENT AND PLANNED PROGRAMMES

Country: Canada

Year: 2007

Canadian Usage from returned reports

Year: 2007

Agency	Purpose of Programme	Program Number	Platforms deployed in 2007	Platforms planned for 2008	Estimated PPT usage for 2007	Estimated PPT usage for 2008	Comments from Program Coordinators
Fish and Wildlife Division, Government of Alberta	Monitor movements of translocated grizzly bears	13266	3	5	0.240	0.300	This program involves radio-collaring problem grizzly bears which are to be moved long-distance. As a result, not all platforms are deployed at any one time. It is difficult to predict how many problem grizzly bears will be captured in any year and, therefore, how many platforms will be deployed. It is also difficult to predict a date when a bear will be captured and a platform deployed or when the bear will enter its winter den and the platform stops transmitting. Therefore, it's difficult to predict the platform year. Presently, my program (13266) has 10 PTTs assigned to it. Three were active this year while only 1 is still active.
	To monitor wolves and grizzly bears to reduce conflict with livestock producers/land owners.	12599	5	10	1.078	2.003	2007: 4 wolf, 1 grizzly bear 2008: 7 wolf, 3 grizzly bear

	Elk Tracking.	32599	20	22	1.400	1.540	
	Grizzly Bear Research, Foothills Model Forest.	3266	1	1	0.099	0.099	
Ministère des Ressources naturelles et de la Faune, Government of Quebec	Eagle protection.	3442	12	12	3.000	2.000	
	Caribou tracking in northern Québec.	959	70	90	3.452	4.438	
Institute for Environmental Monitoring & Research	Monitor caribou populations in Newfoundland and Labrador	2497	42	65	5.178	8.014	Not sure as to the estimated number of PTT-years. Each collar is estimated to last 3-5 years.
Environment Canada, Meteorological Service	Pacific Drifter Program	323	25	25	19.000	20.000	Platform type: SVP-B. Operational deployments in North East Pacific.
	Atlantic Drifter Program	693	6	4	4.000	2.000	Platform type: SVP-BW. Operational deployments in St. Lawrence River and North West Atlantic Ocean.
	International Artic Buoy program	627	15	10	7.230	8.000	Platform type: ICEX ice beacons. Operational deployments in Arctic Basin. The number of buoys deployed in program 627 is higher than normal in support of the International Polar year.The numbers in this report reflect buoys which are transmitting. Many buoys are expected to run for 18 months or more.

	Operational moored deployments in North East Pacific, and East Atlantic Ocean	5626, 5693, 6693	25	25	21.550	21.550	These three programs are covered under separately negotiated Moored Buoy Monitoring contract with Environment Canada.
Environment Canada, Canadian Wildlife Service	Greater Snow goose monitoring	3082	22	42	1.800	2.210	Type of platforms: GPS/ARGOS solar transmitters (2x 30g + 20x 45g)
	Monitor movements of large raptors (birds: Peregrine Falcons etc)	2900	3	5	0.493	0.822	
	Track movement of sea ducks in Beaufort Sea and Chukchi Sea	1706	6	20	3.000	2.900	
	Track Common Murre movements over the annual cycle	21375	10	10	0.500	0.500	
	Track Barrows Goldeneye movements over the annual cycle.	22375	25	25	2.000	2.000	The number of PTTs deployed each year is correct but the number of PTT-years is a prediction based on the attrition (mortality) rate of birds and/or PTTs over the course of the current year (from January 2007 to the present and from now to December 2007) and estimated for 2008.
Environment Canada, Canadian Ice Service	Track ice floes / ice island and validate sea ice	633	7	6	3.000	2.800	Type of platform: CALIBS

	and iceberg drift model.						
Department of Environment, Government of Yukon	Porcupine Caribou Satellite Collar Project.	1207, 9207	15	15	1.438	1.438	This project documents the seasonal range use and migration patterns of the Porcupine Caribou Herd (Rangifer tarandus granti), numbering 123,000 animals. Annual herd movements cover an area of approximately 250,000 square kilometres, making frequent conventional radio telemetry locations expensive. With financial support of co-operating agencies, we have maintained satellite collars on the herd since October 1997. Location data have helped us document seasonal ranges used, timing of migration, and helped us determine the geographical areas we need to travel to in order to conduct our fieldwork.
	YNNK Old Crow Flats Moose.	3535	19	19	0.625	0.625	Using satellite GPS collars, we will track seasonal migration and distribution of moose (*Alces alces*) and examine how moose habitat use within the OCF is related to variation in microclimate, hydrology, and shrub distribution, as well as the timing and spatial extent of moose migration.
	Moose tracking.	3346	24	24	0.559	3.354	
Université du Québec à Rimouski	Characterization of large-scale movements in the arctic fox.	3297	7	7	0.863	0.863	
University of Alberta	Grizzly bear and polar bear tracking.	2846, 12846, 22846	47	45	12.000	12.000	

	Learn about the 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.	3288	20	16	1.370	1.096	Deployed current year: 20 Terrestrial animal platforms, among which 10 Telonics TGW-3580 and 10 Telonics TGW-3680. Planned next year: Approximately 16 Terrestrial animal platforms, among which 6 Telonics TGW-3580 and 10 Telonics TGW-3680.
Ministry of Natural Resources, Government of Ontario	Monitor free-ranging wolves in north-eastern Ontario	3240	8	6	0.500	0.370	
	Tracking of adult female forest dwelling woodland caribou	3219	5	5	0.418	0.103	
Fisheries and Oceans Canada	Track swordfish using electronic PSAT tags	2376	20	0	9.863	0.000	St. Andrews Biological Station.
	Met/Ocean Research	76	36	21	1.750	1.350	Bedford Institute of Oceanography. ARGOS service from CLS America has been generally good, very prompt with technical support. The website has experienced a few glitches and it is sometimes difficult to download data.

	Arctic Marine Mammal tracking and dive recording	1142	10	25	1.223	2.500	Central & Arctic Region. All platform types are ARGOS linked time-depth recorders. Our interest, marine mammal trackers, lies in obtaining the best possible quality (i.e.: many points) of tracks, given a limited energy budget and intermittent transmission opportunities. The present JTA tariff proposal is punishing us because we cannot conform to a slot system without loosing location and dive data.
	Monitor Surface and Subsurface moored scientific installations	704	15	15	0.250	0.250	Witness program.
	Tracking floats launched by Canada in support of the international Argo program.	2442	97	110	5.300	5.500	I am assuming that floats “deployed current year” means the number actually in the water this year, not the number we actually put in the water this year).
	Marine mammal (some sharks) location and diving activity tracking.	788	14	14	4.100	4.100	
Universite Laval	Monitoring of migratory movements of Snowy Owls in the Canadian Arctic	3471	12	16	6.312	8.416	

Environment & Natural Resources, Government of the Northwest Territories	Document seasonal range use, distribution, movements, and fidelity of female boreal caribou throughout their range in the Dehcho.	2814	31	33	7.650	8.140	During Jan/Feb 2007 we deployed 17 collars: 9 were Telonics ARGOS/GPS platforms (TGW3680) and 8 were Telonics satellite collars (ST-20). This brought the total number of collars deployed on the project at that time to 31 (9 TGW3680's and 22 ST-20's). During February 2008 we plan on deploying 4 TGW3680 and 1 ST-20 collars which should bring us up to 33 functioning collars in the program (13 TGW3680's and 20 ST-20's).
	Document seasonal range use and movements of male and female wood bison of the Nahanni bison population.	12814	8	8	1.830	1.830	During July 2007 we deployed 5 collars: 2 were Telonics ARGOS/GPS platforms (TGW3780) and 3 were Telonics satellite collars (ST-20). This was an initial deployment and we may deploy more collars later this year or in March 2008. We would deploy up to 3 more collars (2 TGW3780's and 1 ST-20) during the scheduled capture operation. Given that we usually have transmission times of 5 or 6 hours maximum for our collars it would be nice if we were only charged for the actual usage instead of being charged for one half of a day of use because our transmission times cross some subjective 6 hour boundary.
	To study the seasonal movements and reproductive success of boreal woodland caribou in the Mackenzie Valley Region of the Sahtu, and to collect	2803	15		2.500		Telonics GPS Gen III collars

baseline data for future cumulative effects assessments.						
To study the seasonal movements and reproductive success of boreal woodland caribou in the Summit-Keele region of the Sahtu and to collect baseline data for future cumulative effects assessments.	10803	2		1.500		Habit GPS

To study the seasonal movements and reproductive success of muskoxen located below treeline in the Franklin Mountains area of the Sahtu, and to examine potential muskox / boreal woodland caribou interactions.	11803	5		2.500		Telonics GPS Gen III collars
To study the seasonal movements and reproductive success of the Bluenose east barren-ground caribou herd, and to assist with surveys providing population estimates.	12803	10		3.000		Telonics ST-14s, and ST-20s

	To study the seasonal movements and reproductive success of boreal woodland caribou in the Mackenzie Valley Region of the Sahtu, and to collect baseline data for future cumulative effects assessments.	20803	4		1.000		Telonics ST-14 collars
	To study the seasonal movements and reproductive success of the Bluenose east barren-ground caribou herd, and to assist with surveys providing population estimates	22803	6		2.500		Telonics GPS Gen III collars

Long Point Waterfowl & Wetlands Research Fund	Determining migration pathways and breeding and wintering ground affinities of Lesser Scaup and Greater Scaup.	3031	23	20	1.330	1.100	
Parks Canada	Grizzly Bear monitoring and bear management within Kluane National Park.	1015	1	1	0.100	0.100	
Kintama Research	Fish tracking.	3065	2	2	0.132	0.132	
Department of Defence, Canada	SLDMB for Search and Rescue.	2019	3	5	1.479	2.466	
TOTALS			**756**	**784**	**149.112**	**136.909**	

Polling of users is incomplete since only 43 of the 83 programs reported, therefore the 2007 estimate is based on the usage report provided by CLS America. The number of PTT-years used through August 2007 is reported as 121.32, extrapolating to the end of the year gives an estimate of 182 for 2008. The returned estimates show a slight decrease but this can be attributed to some programs not knowing how many ppts they were going to deploy in 2008. I would expect the usage to be about the same in 2008.

CANADIAN ARGOS USAGE THROUGH AUGUST 2007 from CLS America

Service	**Family**	**PTT Days**	**Total Cost**	**% total time**	**% total cost**	**PPT Years**	

TSLP	Land Animal	22,356.50	$363,389.50	50.49	60.55		
TSLP	Bird	3,469.75	$63,431.50	7.84	10.57		
TSLP	Marine Animal	2,024.00	$20,339.00	4.57	3.39		
TSLP	Fish	274.50	$3,833.50	0.62	0.64		
TOTAL	Animals	28,124.75	450,993.50	63.51	75.14		
TS	Sub Float	1,566.00	$34,072.00	3.54	5.68		
STD	Drifter & Others	8,956.50	$79,912.00	20.23	13.31		
STD	Moored Buoy	5,611.50	$34,926.00	12.67	5.82		
STD	UNDW_STAT	0.25	$22.00	0.00	0.00		
STD	UNDW_VEH	22.75	$262.00	0.05	0.04		
TOTAL	**August**	**44,281.75**	**$600,187.50**			**121.32**	
TOTAL	**December (est)**	**66,422.63**	**$900,281.25**			**181.98**	

Country: China

Year: 2007

A. Agency or programme: China's Argo Project (Program No. 2528)
The Second Institute of Oceanography, State Oceanic Administration

Purpose of programme: Contribution to the international Argo project

Numbers and types of platforms:	(a)	deployed current year:	10
	(b)	planned next year:	12
Estimated number of PTT-years:	(a)	current year:	1.04
	(b)	next year:	1.33

B. Agency or programme: Marine Environmental Observation (Program No. 2466)
National Ocean Technology Centre, State Oceanic Administration

Purpose of programme: Development of Marine Environmental Observation Buoy

Numbers and types of platforms:	(a)	deployed current year:	3
	(b)	planned next year:	5
Estimated number of PTT-years:	(a)	current year:	1
	(b)	next year:	3

Special comments (if any):

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Country: **Kenya (Kenya Meteorological Department)**

Year: **2007**

A. **Agency or programme:** University of Washington, School of Oceanography, and the United States Argo Programme

Purpose of programme: To deploy profiling floats in the Western Indian Ocean

Numbers and types of platforms:
(a) deployed current year: Five (5) Argo profiling floats to be deployed in the Western Indian Ocean in October 2007.
(b) planned next year:

Estimated number of PTT-years:
(a) current year: Five (5) years
(b) next year:

B. **Agency or programme:**

(as above, repeat as often as necessary)

Special comments (if any):

Country: **Republic of Korea**

Year: **2007**

A. **Agency or programme:** 2397 (METRI/KMA)

Purpose of programme: To implement ARGO project of METRI, KMA

Numbers and types of platforms:	(a)	deployed current year: 15 (In preparation)
	(b)	planned next year: 15
Estimated number of PTT-years:	(a)	current year: 1.6
	(b)	next year: 2.7

B. **Agency or programme:** 2096 (KORDI)

Purpose of programme: ARGO-KORDI and East Sea Circulation

Numbers and types of platforms:	(a)	deployed current year: 13
	(b)	planned next year: 12
Estimated number of PTT-years:	(a)	current year: 3.0
	(b)	next year: 3.3

Special comments (if any):

Country: SWEDEN

Year: 2007

A. Agency or programme: 1204 (Thomas Alerstam, Lund University)

Purpose of programme: **Studies of bird migration and orientation**

Numbers and types of platforms:	(a)	deployed current year: **15**
	(b)	planned next year: about **15**
Estimated number of PTT-years:	(a)	current year: **2**
	(b)	next year: **2**

B . Agency or programme: 1870 (Susanne Åkesson, Lund University)

Purpose of programme: Tracking migration of sea turtles

Numbers and types of platforms:	(a)	deployed current year: 2
	(b)	planned next year: 4
Estimated number of PTT-years:	(a)	current year: 0.1
	(b)	next year: 0.2

C. Agency or programme: 2398 (Susanne Åkesson, Lund University)

Purpose of programme: Tracking migration of albatrosses

Numbers and types of platforms:	(a)	deployed current year: 5
	(b)	planned next year: 6
Estimated number of PTT-years:	(a)	current year: 0.2
	(b)	next year: 0.3

Country: The Netherlands

Year: 2007

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. Four 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:	4
	(b)	planned next year:	6
Estimated number of PTT-years:	(a)	current year:	3.5
	(b)	next year:	4.5

B. Agency or programme: **IMARES** (formerly: ALTERRA,) dept. of 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, harbour seals were equipped with satellite tags 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.
Harbour seal, but also grey seals turn out to show much small-scale movement. ARGOS location, though proven very valuable, is not accurate enough to define this. Current

development in GPS localisation of marine mammals proves much more adequate. As high resolution also requires large amount of data to be sent the GSM transmitter turns out to be much more suitable, providing receptors are at hand. For these marine mammals, that regularly come close to shore the method is more promising. Especially In the light of the costs that have strongly increased with the new ARGOS method, the institute has chosen for the other system.

Number and types of platforms: (a) deployed current year: 6 Telonics ST-16 PTTs
(b) planned next year: 0 Telonics ST-16 PTTs

Estimated number of PTT-years: (a) current year: 0.4
(b) next year: 0

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: 9 SEIMAC tx

Estimated number of PTT-years: (a) current year: 0.07
(b) next year: 0.16

Special comments (if any):

ANNEX XII

ACTION SHEET ON DECISIONS OF JTA-XXVII

Ref	Action item	By whom	Deadline
2.8	To assist the JTA Chairperson in the completion of the report "OPSCOM and the JTA"	Chris O'Connors JTA Chairperson	JTA-XXVIII (Oct. 2008)
4.3, 5.8	To implement the PMT pilot activity as soon as possible and to reactivate the offer concerning new generation PMTs	CLS	ASAP
4.3	Users who need downlink capability to start using the demonstration PMTs as soon as they become available	Users	JTA-XXVIII (Oct. 2008)
4.3	To promote the PMT pilot activity at the national level	ROCs	JTA-XXVIII (Oct. 2008)
5.2	To bring the issue of cost implications for installing METOP compatible antennas to the attention of the next OPSCOM (GTS delays).	CLS	OPSCOM-42 (mid 2008)
5.2	To install new antennas according to the following priority areas: the South Atlantic, the Indian Ocean, and the Southwest Pacific Ocean.	CLS	JTA-XXVIII (Oct. 2008)
5.2	To offer solutions for improving data timeliness and to develop data timeliness monitoring tools	CLS	JTA-XXVIII (Oct. 2008)
5.3	To print and distribute the vandalism leaflets in appropriate languages to the fishing industry or fishing authorities	CLS	Ongoing
5.3	To translate the vandalism leaflet in Korean	KMA	JTA-XXVIII (Oct. 2008)
5.3	To translate the leaflet in other languages as required	DBCP Members	JTA-XXVIII (Oct. 2008)
5.3	To provide the WMO and IOC Secretariats with the list of countries using Service Argos for fishing vessel monitoring	CLS	ASAP
5.6, 5.7	To continue with the current arrangements for the independent Chairperson, and JTA to provide a limited funding for covering DBCP Members having activities on behalf of the JTA. CLS to contribute to the DBCP Trust Fund (total USD 17,500)	CLS	Early 2008
5.9	To write to the OPSCOM co-chairpersons in order for OPSCOM to consider the issue of providing datasets on a free and unrestricted basis	Chairperson	OPSCOM-42 (mid 2008)
5.10-iv	To develop further the tool regarding status of local receiving stations (percentage of time they are operational) so that to display additional information such as what operational satellites are being received via each station	CLS	JTA XXVIII (Oct. 2008)
5.10-v	To make the Brazilian Satellites data available via	CLS	ASAP

	the new Argos data processing system		
6.6-ii	To study new scenarios regarding the unused IDs	CLS	JTA XXVIII (Oct. 2008)
6.6-vi	To draft the next Five Year Plan (FYP) to be discussed at the next JTA meeting	CLS	JTA XXVIII (Oct. 2008)
8.6	To produce a more simple JTA Session final report for the next Session that will stress on recommendations, agreements, and agreed action	Secretariat	JTA XXVIII (Oct. 2008)
8.16	To lead the revision process of the Role of the ROC document and make a synthesis to be reviewed at the next JTA Session	Chairperson	JTA XXVIII (Oct. 2008)
8.17	To establish a mailing list and provide the ROCs with information via an electronic mailing	CLS/JCOMMOPS	Early 2008
9.2	To draft out a new template for the national reports to be attached as an annex to this meeting's final report	Secretariat	ASAP

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ANNEX XIII

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ANNEX XIV

LIST OF ACRONYMS AND OTHER ABBREVIATIONS

ADS	Automatic Distribution System (Argos)
AHRPT	Advanced High Rate Picture Transmission
BUFR	Binary Universal Form for Representation of Meteorological Data
BUOY	Report for Buoy Observations
CDA	Command Data Acquisition
CLS	Collecte Localisation Satellites
CNES	Centre National d`Etudes spatiales (France)
DBCP	Data Buoy Cooperation Panel (WMO-IOC)
E-SURFMAR	Surface Marine programme of the Network of European Meteorological Services, EUMETNET
EUMETNET	Network of European Meteorological Services
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
ESPC	NOAA Environmental Satellite Processing Centre (USA)
FRGPC	French Argos Global Processing Centre
FYP	Five-Year Plan (of JTA)
GAC	Global Area Coverage
GIS	Geographic Information System
GTS	Global Telecommunication System (WMO)
HRPT	High Rate Picture Transmission
IABP	International Arctic Buoy Programme
IBPIO	International Buoy Programme for the Indian Ocean
ID	Platform Identification Number
IJPS	Initial Joint Polar-Orbiting Operational Satellite System (NOAA, EUMETSAT)
IMB	Ice Mass Buoy
INPE	Instituto Nacional de Pesquisas Espaciais (Brazil)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IRD	Institut français de recherche scientifique pour le développement en coopération (formerly ORSTOM)
ISABP	International South Atlantic Buoy Programme
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM *in situ* Observing Platform Support Centre
Jrev	permanent JTA review mechanism
JTA	Argos Joint Tariff Agreement
LAC	Local Area Coverage
LDR	Low Data Rate
LUS	Limited Use Service (Argos)
LUT	Local User Terminal (Argos)
METOP	Meteorological Operational satellites of the EUMETSAT Polar System (EPS)
MOU	Memorandum Of Understanding
NESDIS	NOAA Satellites and Information Service
NOAA	National Oceanographic and Atmospheric Administration (USA)
NORI	National Oceanographic Research Institute (Korea)
NPDBAP	North Pacific Data Buoy Advisory Panel
NPOESS	National Polar-orbiting Operational Environmental Satellite System (USA)
NWP	Numerical Weather Prediction
OCO	NOAA Office of Climate Observation (USA)
OPSCOMM	Argos Operations Committee (NOAA, CNES, EUMETSAT)
PDF	Adobe Portable Document Format
PMT	Platform Messaging Transceivers
POES	Polar-orbiting Operational Environmental Satellite
PTT	Platform Transmitter Terminal (JTA)
PTT.year	Equivalent to a PTT reporting every day during one year

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

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