

## MINUTES OF MEETING

**Location:** EUROCONTROL HQ

**Meeting Date:** 20 & 21 April 1999

**Submitted by:** EUROCONTROL

**Date:** 29 April 1999

**Subject:** CAFT/Euro Datalink Focused Group

**Enclosure(s):** Attachment 1 (Distribution list)  
Attachment 2 (Agenda this meeting)  
Attachment 3 (Working Papers)  
Attachment 4 (Action List)  
Attachment 5 (List of Issues & Assumptions)

**Participants:** ALTY Peter, EUR/PPM; BEHIER Patrice, EUR/ATD; BELITZ Thomas, DFS; BERENDS Ben, KLM; DELHAISE Patrick, EUR/COM; DEBUCHY Patrick, Air France; Detlef Schulz-Rueckert, DFS; FUELBER Walter, Lufthansa; FUJISAKI Norman, FAA; GAGNON Tony, ICON/EUR; GILES Stephen, FAA; GLICKMAN Stephen, Boeing; HOF Henk, EUR/SCS; John Turnbull, NATS; LACROIX Bernard, EUR/PPM; NUGENT Marie, EUR/COM; OWEN Davies, (NATS); PIROTTE Kathleen, Boeing; ROCA Jose, EUR/ATD; SAGNIER Yves, CENA; VAN ROOSBROEK Danny, EUR/COM; WANDELS Alex, EUR/ATD; ZERKOVITZ Steve, IATA;

**Agenda:** See Attachment 2

**History:** Draft 1.0

## 1. Opening

The Business Case Workshop for European Data link Implementation was held on 20-21 April. The workshop was chaired jointly by Ben Berends (KLM) and Henk Hof (EUR/SCS). The meeting was attended by 24 delegates, representing IATA, DFS, NATS, CENA, KLM, DLH, Air France, Boeing, FAA and EUROCONTROL.

The purpose of the workshop was to kick-off preparation for the Business Case development of European Data Link Implementation in the near and mid-term (2002-2007).

There were no Service Provider representatives at this first meeting but it was acknowledged that they had given their full support to the Link 2000+ initiative which is tasked with the deployment of operational mobile data link services for ATC and AOC, and the supporting infrastructure, in the near and mid-term (indication 2002-2007).

It was agreed to include this group in the C/AFT initiative and that a change of name was necessary to illustrate this. (**Note:** After the meeting the name CAFT/Euro Datalink Focused Group was decided upon).

## 2. Workshop Objectives & Agenda

The CAFT/Euro Datalink Focused Group workshop agreed to develop a Business Case that includes a strategic analysis and a probabilistic Cost Benefit Analysis using the C/AFT model. To achieve this the group would have to define the European business environment, adapt the C/AFT influence model, to resolve business case issues/assumptions and thereby set actions to collect data, and to discuss the Strategic approach. The timeframe for completion of these objectives and the delivery of a Business Case for operational mobile data link services for ATC and AOC, and the supporting infrastructure is end 1999 as this will coincide with the objective of the LINK2000+ Drafting group to produce a LINK2000+ Programme document which will provide all the arguments for commitment to the programme from high-level stakeholders. In April 2000 the Provisional Council is to review/approve the Implementation Plan and supporting Business Case.

The meeting schedule for EuroC/AFT is:

- Kick-off (20-21 April)
- Mid-term review workshop (1-2 or 2-3 Sep)
- Final review workshop (end 99)

The Agenda was approved. (See Attachment 2)

## 3. The European Context

A number of presentations were made so as to provide:

- A context for the work of this group (A. Wandels -LINK2000+);
- Information on analysis' already carried out by one ATSO (DFS);
- An Airline's perspective (KLM); and
- A General look at the European Business Case Environment (H. Hof)

Following is a list of main issues addressed:

### 3.1 LINK2000+

Alex Wandels briefed everyone that LK2+ was based on Petal II and its extensions. He stressed that the planning would be discussed with all stakeholders involved and could be adjusted if necessary. There were no plans to have mandatory equipage of data link in the early implementation phase as Petal II demonstrated a high degree of interest. He gave indication of the timeframe for implementation to be:

- Towards 2002 – planning of implementation
- 2002-2005 – initial implementation in ACC's additional to sectors covered by Petal II
- 2005-2007 – more realistic time for more broad-based initial data link implementation

The Business Case developed by this group would be instrumental in convincing Stakeholders to invest in data link and would also provide a basis for EUROCONTROL management to adopt the LK2+ programme.

### 3.2 DFS Preliminary Results

D. Schulz-Ruckert presented the DFS approach and the preliminary results concluded from this CBA. He did stress that the CBA carried out focused more on benefits than costs due to lack of data on the latter.

Conclusions of CBA:

- The introduction of Data Link Services cannot be justified by economic reasons only. A strategic/qualitative argument must be found.
- To avoid capacity shortages in 2006 timeframe, data link implementation is required sooner than later
- Qualitative reasons found for introduction of data link services in order to enhance and improve the overall quality of the ATC Services due to capacity limits on voice frequencies and overload of executive controllers.
- There is a strategic requirement to introduce Air/Ground Data Link services within DFS controlled airspace in a phased approach. Initial implementation of initial Data Link applications in 1999, followed by non-time critical Data Link Services in 2005 and time critical Data Link Services from 2007 onwards (dependant on operational requirements).
- Results of analysis were made by means of calculations as opposed to simulations

### 3.3 KLM Presentation

Ben Berends (KLM) outlined the needs of a typical European Airline that was based on an effective ATM system providing capacity to future demands. An ideal solution to the imminent capacity burdens will result in greater efficiency and punctuality of operation. However, such an infrastructure should not be too expensive to implement i.e. it should provide a return on investment to airlines *using* it.

He stated that Data Link based on ATN had a good foundation in that it was SARPs compliant and therefore accommodated global requirements. A global technology would help reduce cost to individual airlines. The costs of implementing Data Link would have to be returned in benefits exclusive to those airlines that invest, and AOC functionality would be

seen as such. He stressed that maintenance of the safety of operation was a fundamental requirement.

S. Zerkowitz stressed the notion of collateral benefit with introduction of Data Link – delay reduction brought about by consequence of other A/C usage 8.33 and RVSM! Controller workload reduced and therefore free to handle more traffic through use of Data Link.

### 3.4 European Business Case Environment

H. Hof presented issues that could lead to a Business Case for Data Link in Europe. Main points being:

- Route charging mechanism used in Europe demonstrate that route charges could decrease if ratio of flights is higher than the cost basis
- Strategic case for Data link shows majority of services require it as an enabler and since deployment of Data link takes 5-7 years and this being the critical time for capacity saturation that implementation should start asap.
- Incentives were given as e.g strategic, operational, financial and implementation directives.

## 4. FAA

N. Fujisaki (FAA) presented the migration path towards using Data Link in the US.

- Build 1 (domestic CPDLC of initial 4 messages) would be implemented nationally by 6/03 using VDL-2 as A/G subnetwork
- Build 1A (domestic CPDLC of 18 messages) would be deployed nationally by 6/05 using VDL-2 as A/G subnetwork.
- Build 2 (dom/int'l 114 CPDLC messages) would be deployed nationally by 6/06 using VDL-2 as A/G subnetwork
- Build 3 (expanded ATN message set) using NEXCOM as A/G subnetwork

To date, the FAA has committed to proceeding with Build I and IA only. Build 2 and Build 3 decisions are likely to be made next year.

He added that after 2005 high and super high sectors would transfer to TDMA i.e. digital voice. He said that currently there were obstacles at airport hubs e.g. Atlanta, San Francisco to making airspace changes due to lack of airspace frequencies, therefore stressing that in the US there was more of a problem in the terminal areas rather than En Route. In future, higher altitude frequencies would be freed-up and re-used at lower altitudes due to transition to digital technology. 5 years are required in the US for equipage, it is then intended to make NEXCOM digital voice equipage mandatory in 2005 if operated over FL240 .

The possibility of using both NEXCOM and CPDLC at same time period is under consideration in the US. Other Data Link services to be used will largely depend on the users of the system and supporting business cases.

N. Fujisaki stressed that Service Providers and users needed to collaborate on the process before they commit to implementation as there are issues with changes to be made to air crafts (114 messages). Certification problems and safety issues need to be addressed also. It was found that the cost of retrofit was higher than that of forward-fit (using C/AFT results)

based on 18 messages. The projected VDL-2 message costs used illustrated in CBA are based on ARINC as Service Provider in the US. These costs would be paid by the FAA, however, eventually by the user if the US moves to a user fee based system as in Europe (2005 onwards). He mentioned that there was an extensive report on the CPDLC Build I and IA investment analysis on the FAA website.

N. Fujisaki stressed that several key issues needed to be monitored as US Data Link Implementation proceeds:

- High VDL-2 message costs in the long term
- ATNSI software development staying on schedule
- Sensitivity to equipage rates – all eyes are on AA to determine how much benefit will be realized. The development of affordable retrofit would improve the business case dramatically.

The FAA would look to the European business case to help them with their future investment decisions. Oceanic sector also needed consideration and modifications to aircraft design i.e. retrofit & forward-fit, including safety. Long-term implementation of Data Link with VDL-3 (US Build 3) probably will be addressed together with the CPDLC Build 2 investment analysis.

#### **Comments by Group:**

- US Airlines motivation to use VDL-2 derives from need to address AOC growth & demand and ACARS running short
- It was considered that AOC traffic growth would have an impact on VDL-2. Due to ACARS running short in the US the motivation for airlines to move to VDL-2 is derived from need to address AOC growth and demand.
- The idea of a Roadmap to illustrate future implementation was considered a good idea and one which was also being used in Europe. Due to Airlines requiring 5 years notice to equip to Data Link (or any new system) and if the 2005 scenario is to go ahead, the FAA were asked whether an official notice of some kind was going to be published on rules regarding forward-fit. N. Fujisaki responded that the FAA currently does not envision mandatory CPDLC equipage, but rather plans to rely on user benefits to motivate users to voluntarily equip.
- FAA were asked whether they had carried out an analysis on a *do nothing* scenario. N. Fujisaki replied that the analysis did not do this and that it had been carried out **after** the Airlines/FAA came forward with an agreement in concept, which significantly narrowed the alternatives.
- The FAA responded to a question regarding the decision schedule on Build 2, stating that a decision likely would be made by mid-2000. One of the FAA's big motivations for attending this meeting was to understand the European business case more fully.

## **5. C/AFT Approach**

Kathleen Pirotte (Boeing) and Steve Glickman (Boeing) both gave presentations covering C/AFT's purpose, structure, history, tools and resources. They primarily explained the ATS Data Link Focus Group which was established to provide a high level economic analysis of the value of equipping with an advanced ATS Data Link.

The presentations covered Assumptions, AOC & ATC situation, the C/AFT modelling process, model inputs and results, potential benefits of future Data Link enhancements and

conclusions. (Slides of presentations are attached with these minutes). Assumptions, Model Structure and Conclusions are summarised here in the minutes:

**Assumptions:**

- No alternative analysis of a 'do nothing' scenario was tackled and Data Link was the only enabler considered. Objective was to determine the benefits of Data Link and to price these benefits i.e. would the solution be affordable?
- Analysis was performed for Cruise/Terminal Transition area capacity improvement US National Air Space
- The Analysis was based on the Industry Airline perspective
- Infrastructure readiness would drive equipage
- Evaluated the value of transitioning from ACARS to VDL-2
- Both AOC and ATC benefits were considered

**Data Link Model Structure:**

- C/AFT transition logic diagrams were used to frame the data link investment analysis and use was made of the FAA Atlanta study that formed the basis for delay-reduction benefit estimates.
- Influence diagrams were used to present graphical representation of the variables that affect net present value for data link. Tornado diagrams were used to show the relative impact of a range of uncertainties of variables on Net Present Value (NPV).
- The Data Link decision analysis model calculated the net present value of cash flows from the years 2000-2020 for the proposed data link investment and allowed for probabilistic analysis. The model had several components each containing assumptions of their own:
  - Constants – Rates, timeliness of equipage, data on volume of aircraft etc.
  - Traffic Growth
  - Delay Growth
  - Infrastructure
  - Equipage
  - AOC & ATC related costs
  - Benefits – quantification of benefits related to AOC operations and ATC delay reductions

**Conclusions:**

- Forward fit equipage of VDL-2 for AOC applications has a good return on investment
- Forward fit equipage of VDL-2 for full Data Link has a reasonable return on investment
- Retrofit equipage will be driven by ATC applications
- Data Link equipage for ATC-only does not provide a reasonable return on investment
- VDL-2 Data Link is a strategic, long-term investment

**Comments from Group:**

- It was remarked that the business case should be understandable to Stakeholders. K. Pirotte replied that the C/AFT analysis had been responsible for US airlines reaching a consensus on VDL-2 implementation and that it had influenced the FAA CDPLC programme. She recommended use of data representing return on investments for Data Link Scenarios as a good means of communicating the results of the analysis.
- It was agreed that ATM costs would need to be included in the business analysis for European airspace, as ATM costs are directly charged to the airlines in Europe.
- The assumed avionics equipment costs assumed in the C/AFT analysis were thought to be too low as it was considered that Data Link costs to avionics would be greater. K. Pirotte admitted that this had been a controversial assumption in the analysis but that it had been based on airline input.
- It was considered useful to have more information on delay reductions for Baseline 1 & 2 from the B2T whose objective were to define the operational scope of an extension to the baseline 1 specifications (i.e. the Petal II specifications version 3.X) that can be provided by ATS organisations through 2010 (extension known as Baseline 2).
- It was clarified that the US delay problems were not unlike the European Scenario as terminal delays had been identified in the US whereas En Route was being considered in the European scenario. Given the scale of both regions, en route traffic in Europe has characteristics in common with US terminal airspace.

## 6. Simulation Study on CPDLC

Patrick Behier briefed the group on the results of a computer simulation study of the potential impact on controller workload and sector capacity resulting from the implementation of CPDLC. He reminded the group that the findings were still in draft form. The simulation tool used was called CAPAN that assessed sector capacities based on an in-depth analysis of the controller workloads. CAPAN measured the ATC tasks imposed on sector controllers to handle traffic per flight and per sector crossed.

The results of 3 separate exercises carried out, illustrated a potential benefit of CPDLC of reducing execution times for standard RT communication messages by 50%. Saves 17% on controller workload and increases capacity by 17-40%. Further results of this study would be available Fall 99.

**Comments/feedback from Group:**

- Owen Davies (NATS) informed the group the EOLIA project had carried out studies on controller workload assessment giving similar results. He stated that real-time simulations would take place in December 99 and that results would be available mid-2000 **Action 11**
- Steve Giles (FAA) made the comment that there were 3 cases to be resolved i.e. Operations, Business and Safety and that these 3 groups should have a common set of assumptions.
- Yves Sagnier (CENA) informed that group that simulations were being carried out at CENA on the following **Action 11**:
  - ESCAPADE: real-time simulations on the use of DAPs in an approach environment (medium simulated: Mode S). Report would be available 5/99 under PETAL II umbrella.

- VOCALISE: studies on controller-pilot vocal recordings, and later simulations, on replacing voice by Data Link
- COCLICO: real-time simulations involving CPDLC and co-operative tools (ERATO) as a contribution to the EOLIA project.
- Rob Mead clarified the relationship between Baseline 1 and 2 summarised as follows:
  - Petal II extension = Baseline 1 i.e. CPDLC set (62 uplink & 31 downlink messages)
  - Build 2 (domestic/int'l 114 CPDLC messages) = Baseline 2
  - It was stated that baseline 1 were not ready yet as they were based on the results of the Petal II extension.

## 7. Business Case Assumptions & Issues

See Attachment 5

## 8. AOB

Due to time constraints the Strategic Case of the Business Case analysis was not discussed in length. H. Hof will distribute a paper on the Strategic case and distribute to this Group for their review. **Action 8**

Ben Berends thanked delegates for their input to the Business Case and stressed the importance of sharing data to find a global solution to ATM. Other airlines that did not attend would be kept informed through the DFS Task Force of the importance of their input to this Group.

## 8. Actions

See Attachment 4

## 19. Next meeting date

The next meeting of this group would take place on either 1-2 September or 2-3 September depending on co-ordination with the Core C/AFT team. It would be a focused working group as decisions would need to be taken on data assumptions used in the C/AFT model and iterations are foreseen. **Action 7**

**ATTACHMENT 1****Distribution List**

<b>NO.</b>	<b>NAME</b>	<b>ORG/INSTIT</b>	<b>TEL</b>	<b>FAX</b>	<b>E-MAIL</b>
1.	ALTY Peter	EUR/PPM	+ 32 2 729 3491	+ 32 2 729 9086	<a href="mailto:peter.alty@eurocontrol.be">peter.alty@eurocontrol.be</a>
2.	BEHIER Patrice	EUR/ATD	+ 32 2 729 3338	+ 32 2 729 9087	<a href="mailto:patrice.behier@eurocontrol.be">patrice.behier@eurocontrol.be</a>
3.	BELIZ Thomas	DFS	+49 69 8054 2434	+ 49 69 8054 2495	<a href="mailto:thomas.belitz@dfs.de">thomas.belitz@dfs.de</a> or <a href="mailto:Tbelitz@compuserve.com">Tbelitz@compuserve.com</a>
4.	BERENDS Ben	KLM	+ 31 20 649 9736	+ 31 20 649 9790	<a href="mailto:benb@klm.nl">benb@klm.nl</a>
5.	BERSAT Jean-Luc	AIRBUS	+		<a href="mailto:jean-luc.bersat@airbus.fr">jean-luc.bersat@airbus.fr</a>
6.	BRUINENBERG Henk	LVB Netherlands	+ 31 20 406 32 33	+ 31 20 406 27 78	<a href="mailto:bruinenberg@lvnl.nl">bruinenberg@lvnl.nl</a>
7.	CHEW Russell	American Airlines			
8.	DAVIES Owen	NATS	+ 44 171 832 5214	+ 44 171 832 5575	<a href="mailto:owen.davies@nats.co.uk">owen.davies@nats.co.uk</a>
9.	DEBUCHY Patrick	Air France	+ 33 1 41 56 80 11	+ 33 1 41 56 80 09	<a href="mailto:padebuchy@airfrance.fr">padebuchy@airfrance.fr</a>
10.	DELHAISE Patrick	EUR/COM	+ 32 2 729 3478	+ 32 2 729 9083	<a href="mailto:patrick.delhaise@eurocontrol.be">patrick.delhaise@eurocontrol.be</a>
11.	FUELBER Walter	Lufthansa	+ 49 40 5070 2469	+ 49 40 5070 8032	<a href="mailto:walter.fuelber@dlh.de">walter.fuelber@dlh.de</a>
12.	FUJISAKI Norman	FAA	+ 1 202 358 5227	+ 1 202 358 5543	<a href="mailto:norman.fujisaki@faa.gov">norman.fujisaki@faa.gov</a>
13.	GAGNON Tony	ICON/EUR	+ 44 171 494 9994	+ 44 171 494 9995	<a href="mailto:tony.gagnon@icon-consulting.com">tony.gagnon@icon-consulting.com</a>
14.	GILES Stephen	FAA/HTI	+ 1 202 493 0705	+ 1 202 493 0703	<a href="mailto:stephen.ctr.giles@faa.gov">stephen.ctr.giles@faa.gov</a>
15.	GLICKMAN Steven	Boeing	+ 1 425 237 6729	+ 1 425 237 6729	<a href="mailto:steven.glickman@pss.boeing.com">steven.glickman@pss.boeing.com</a>
16.	GRAHAM Robert	EUR Experimental Centre - Bretigny			<a href="mailto:robert.graham@eurocontrol.fr">robert.graham@eurocontrol.fr</a>
17.	HOF Henk	EUR/SCS	+ 32 2 729 3329	+ 32 2 729 9083	<a href="mailto:henk.hof@eurocontrol.be">henk.hof@eurocontrol.be</a>
18.	HULLET John	EUR/PPM	+ 32 2 729 3452		
19.	KNAEPS Bart				<a href="mailto:bart-knaeps@rlw-rva.be">bart-knaeps@rlw-rva.be</a>
20.	LACROIX Bernard	EUR/PPM	+ 32 2 729 3601	+ 32 2 729 9082	<a href="mailto:bernard.lacroix@eurocontrol.be">bernard.lacroix@eurocontrol.be</a>
21.	LADELUCA Joe	FAA			<a href="mailto:joe.ladeluca@faa.gov">joe.ladeluca@faa.gov</a>
22.	LUCIANO Bozzo	Alitalia			<a href="mailto:bozzo_luciano@alitalia.it">bozzo_luciano@alitalia.it</a>
23.	MEIER-JOSEPH Bernhard	CROSSAIR			<a href="mailto:MEB@crossair.ch">MEB@crossair.ch</a>
24.	MEYENBERG Eike	EUR			<a href="mailto:eike.meyenberg@eurocontrol.be">eike.meyenberg@eurocontrol.be</a>
25.	MISSAULT Ronny	EUR Experimental Centre – Bretigny			<a href="mailto:ronny.missault@eurocontrol.fr">ronny.missault@eurocontrol.fr</a>
26.	NUGENT Marie	EUR/COM	+ 32 2 729 3144	+ 32 2 729 9083	<a href="mailto:marie.nugent@eurocontrol.be">marie.nugent@eurocontrol.be</a>
27.	PADE Dieter	AOPA	+ 49 6103 420 81	+ 49 6103 420 83	<a href="mailto:info@aopa.de">info@aopa.de</a>
28.	PIROTTE Kathleen	Boeing	+ 1 425 717 1075	+ 1 425 717 1191	<a href="mailto:kathleen.pirotte@pss.boeing.com">kathleen.pirotte@pss.boeing.com</a>
29.	RENAUD Philippe	EUR	+ 32 2 729 3373		
30.	ROCA Jose	EUR	+ 32 2 729 3297	+ 32 2 729 9087	<a href="mailto:jose.roca@eurocontrol.be">jose.roca@eurocontrol.be</a>

NO.	NAME	ORG/INSTIT	TEL	FAX	E-MAIL
31.	ROSE Howard	British Airways			hcrld@aol.com
32.	SAGNIER Yves	CENA	+ 33 1 695 77 091	+ 33 1 695 77 355	SAGNIER_Yves@cena.dgac.fr
33.	SCHULZ-RUECKERT Detlef	DFS	+ 49 69 8054 2024	+ 49 69 8054 2096	<u>detlef.schulz- rueckert@dfs.de</u> or DD.ONNET@t-online.de
34.	SELVES Gerry	British Airways			Gselves@compuserve.com
35.	TURNBULL John	NATS	+ 44 1293 576 377	+ 44 1293 576 381	john.turnbull@nats.co.uk
36.	UNNASCH Brad	United Airlines			Brad.Unnasch@ual.com
37.	VAN ROOSBROEK Danny	EUR/COM	+ 32 2 729 3471	+ 32 2 729 9083	danny.van- roosbroek@eurocontrol.be
38.	VARLOUD Philippe	EUR/CRCO	+ 32 2 729 3820		Philippe.varloud@eurocontrol.be
39.	VILLWOCK Hartmut				hartmut_villwock@compuserve.com
40.	VISLE Guy	EBAA			ebaa@compuserve.com
41.	WANDELS Alex	EUR/ATD	+ 32 2 729 3343	+ 32 2 729 3589	alex.wandels@eurocontrol.be
42.	ZERKOWITZ Steve	IATA	+ 32 2 626 1800	+ 32 2 648 51 35	<u>steve.zerkowitz@pandora.be</u> and zerkowitzS@iata.org

**ATTACHMENT 2****AGENDA**

<b>Day</b>	<b>Time</b>	<b>Item nr.</b>	<b>Subject</b>	<b>Papers</b>
<b>20 April</b>	10.00 - 10.30	1	Opening & Introductions	
--	10.30 - 11.00	2	Workshop objectives and Agenda	
--	11.00 - 13.00	3	The European Context <ul style="list-style-type: none"> <li>• Link 2000+</li> <li>• The Business Case Environment <ul style="list-style-type: none"> <li>• General</li> <li>• Airline view</li> <li>• ATSO view</li> </ul> </li> </ul>	
--	14.00 - 15.00	4	<ul style="list-style-type: none"> <li>• C/AFT Introduction</li> <li>• Decision Logic diagram</li> </ul>	
--	15.00 - 16.00	5	C/AFT US Datalink Analysis	
--	16.00 - 17.00	6	Business Case Assumptions & Issues	
<b>21 April</b>				
	9.00 – 11.00	6 cont'd	Business Case Assumptions & Issues	
--	11.00 – 13.00	7	The Strategic Case	
--	14.00 - 15.00	8	Conclusions, Planning & Action	
--	15.00 - 15.15	9	Next Workshops	
--	15.15 - 15.30	10	Closing	

**ATTACHMENT 3****Working Papers**

<b>Title</b>	<b>Author</b>	<b>Relevant Agenda item</b>
European Data Link Business Case Development Plan and Issues – <i>WP1</i>	H. Hof	7
Assessment of CPDLC impact on controller workloads and sector capacity – <i>WP2</i>		6

**ATTACHMENT 4****ACTION LIST**

<b>No.</b>	<b>Description</b>	<b>Who</b>	<b>When</b>
Mtg1- 1.	Provide ATSO's/EUROCONTROL's implementation plans of Datalink services which have been requested by EUROCAE sub-group 4	J. Roca	Prior to 18 June
Mtg1- 2.	Provide EUROCAE sub-group 4 minutes to this group	J. Roca	Week 26 April
Mtg1- 3.	Request the following data from ARINC/SITA at 11 May meeting of DLF-TF (Datalink Facilitation Task Force) and subsequently forward to this group: <ul style="list-style-type: none"> <li>• High-level capability plans regarding VDL-2 Implementation</li> <li>• Strategy with regards to non-usage of Datalink services in Europe</li> <li>• Indication of rate charges to users of VDL-2/AOA whilst providing an indication of volume involved</li> <li>• Numbers or %'s of European Airlines currently using AOC</li> <li>• Numbers of equipped European Aircrafts currently using AOC</li> <li>• Total AOC message volume data in Europe</li> <li>• Numbers of ACARS equipped Aircrafts in Europe</li> </ul>	B. Berends	mid-May
Mtg1- 4.	Forward Article from 'La Recherche' publication to EUROCONTROL	Y. Sagnier	asap
Mtg1- 5.	Distribute criteria parameters documentation with regards to data input on costs	S. Glickman	Week 26 April
Mtg1- 6.	Provide ATS Infrastructure costs to implement Datalink	SCHULZ-RUECKERT Detlef (DFS) O. DAVIES (NATS) SAGNIER Yves (CENA)	Before 21/5
Mtg1- 7.	Provide information on dates/venue for next meeting of this group	K. Pirotte	asap
Mtg1- 8.	Provide data on constants to Boeing	H. Hof	asap
Mtg1- 9.	Collect data from Boeing PIT representative with regards to avionics design	K. Pirotte	asap
Mtg1- 10.	Draft papers on Strategic case for Business Case for Datalink Implementation and distribute to this Group	H. Hof	July
Mtg1- 11.	ATSO's undertaking simulations on Data Link simulations will keep this group informed of their status	O. DAVIES (NATS) SAGNIER Yves (CENA)	ongoing

**ATTACHMENT 5****List of Issues and Assumptions**

Issue No.	Description	Resolution	Assumptions	Contact Person	Status
1	What regions in Europe will be part of the analysis?	Core Area of Europe as this is in line with LK2+ Programme. Data Link would be instrumental in solving delay problems in this core area which are mostly capacity related.	✓	H. Hof (EUR)	
2	What assumptions do we make about each state's ATS Provider plans?	Reference was made to the ACCESS ATN deployment plan. However, it was considered that more information on each ATSO's data link plans (i.e. functionality & timeframe) were necessary before a baseline assumption could be made. <b>Action 1</b>		J. Roca (EUR)	Ongoing Action – expected to have ATSO plans by 18 June
3	What are the European VDL-2 plans?	The following assumptions were made by the group with need clarification from STNA & ARINC. <b>Action 3</b> <ul style="list-style-type: none"> <li>▪ VDL-2/AOA initial coverage by SITA by mid-2000</li> <li>▪ VDL-2 initial coverage by ARINC by end 2000</li> </ul>	✓	B. Berends (KLM)	Ongoing Action – expected to have confirmation from ARINC/SITA through B. Berends by mid-May
4	What phases of flight do we consider?  At the Working Group it was considered more appropriate to tackle this issue differently and to ask the question:  What types of communication/control is data link applicable to?	An assumption was made to handle Data Link message services from a Planning & Strategic perspective. Planning would include departure clearance messages. Tactical messages would be excluded from the Business Analysis and only services that have a well-defined operational context would be used in the business analysis. Reference was made to ODIAC documentation for more related	✓		

Issue No.	Description	Resolution	Assumptions	Contact Person	Status
		information.  S. Zerkowitz stressed the point that HMI should be taken into account in the Business Analysis as it had an impact on the cost of investment and because HMI could reduce delays as much as good networks could.			
5	What is the AOC situation in Europe? i.e. % of airlines using AOC and total AOC message volume.	Both aircraft operators using AOC today and those not currently using AOC would be considered in the Business Analysis. The added value for those airlines who do not currently have AOC would have to be defined.  Further data would need to be collected before undertaking the analysis. It was considered of value to request statistical data from ARINC & SITA. <b>Action 3</b>	✓	B. Berends (KLM)	Ongoing Action – expected to have confirmation from ARINC/SITA through B. Berends by mid-May
6	What is the percentage of ACARS equipped aircrafts?	This is related to assumption 5.  Further data would need to be collected from ARINC & SITA. <b>Action 3</b>		B. Berends (KLM)	Ongoing Action – expected to have confirmation from ARINC/SITA through B. Berends by mid-May
7	If the percentage is small can we consider non-ACARS transition to VDL-2?	Covered in Assumption 5			
8	Are there frequency congestion problems?	It was considered that any congestion problems with VDL-2 will have been resolved by the time initial data link implementation takes place. The Business Case Analysis would assume	✓	P. Delhaise (EUR)	

Issue No.	Description	Resolution	Assumptions	Contact Person	Status
		no VDL-2 growth constraints.			
9	Will SITA participate in the analysis?	It was stated that both SITA and ARINC were willing to co-ordinate in the Business Case development.			
10	Will the Atlanta study be used as the basis?	The Atlanta study was not considered directly appropriate for the European environment. European simulation data would be used for the purpose of the Business Case.			
11	Is European benefit data available?	Yes, initial data on benefits is available, as presented by P. Behier		P. Behier (EUR)	
12	How to include ATSO cost/benefits?	<p>The assumption made here was that the ATSO benefits would be transferred to air operators due to the route charging system in Europe.</p> <p>The Baseline scenario would be based on the ATNI-TF ATN deployment scenario 2000-2015.</p> <p>More data would be required from ATSO's with respect to their ATS infrastructure costs. <b>Actions 3 &amp; 6</b></p>	✓	<p>D. Schulz-Rueckert (DFS)</p> <p>O. Davies (NATS)</p> <p>Y. Sagnier (STNA)</p>	Ongoing Action.
13	Need measures of status quo in Europe	EUROCONTROL would provide the data regarding constants. Much data has already been collected through the ATNI-TF work. <b>Action 8</b>		H. Hof (EUR)	Ongoing action
14	What is the relative importance of efficiency and capacity as benefits?	The assumption used would be that capacity benefits would be measured by delay reduction. The approach of incremental benefits would be used. Efficiency will be taken into account	✓		

Issue No.	Description	Resolution	Assumptions	Contact Person	Status
		whenever this can be quantified.			
15	Is the 'minimal avionics design assumption' valid?	Further research/collaboration required by group before a clear assumption can be made in relation to this.  Boeing representative of PIT would be contacted for further data. <b>Action 9</b>		K. Pitotte (Boeing)	Ongoing Action
16	Is the approach:  2000-2015 for equipage costs and 2000-2020 for operating costs ?	This assumption was agreed by the group. Equipage stops at a certain date but benefits still come in years after! LK2+ will be co-ordinated with on this assumption.	✓		
17	Is the assumption 'equipage comes after infrastructure readiness' valid?	The ground infrastructure will be ready as Petal II progresses. This assumption is valid.	✓		
18	What are the CPDLC deployment plans?	It is assumed they will be based on the ATNI-TF ATN deployment scenario.		H. Hof (EUR)	
19	What are the stages of equipage?	Not covered during Workshop			
20	What perspective should the analysis take?	The analysis will take the view of the airline perspective	✓		
21	What operational assumption do we make?	Baseline 1 is considered a good operational assumption to base the analysis on as it is based on Petal IIe. The oceanic messages which are likely to be included in Baseline 2 are not considered necessary for this analysis.  The assumption was to have a common	✓	J. Roca (EUR)	Ongoing action of providing status to this group.

Issue No.	Description	Resolution	Assumptions	Contact Person	Status
		European message set.  Baseline 1 is not yet finalised but J. Roca is tasked with providing more information from EUROCAE sub-group 4. <b>Action 2</b>			
22	Which Communication Service Providers do we consider in the analysis?	It is assumed that SITA/ARINC are the only Communication Service Providers for aircraft in flight.	✓		
23	Who pays the ATC & AOC communication costs?	ATC communication costs to be paid by ATSO's and AOC communication costs to be paid by Aircraft Operators.	✓		
24	Will benefits to airlines be exclusive?	It is assumed in this analysis that non-equipped airlines will get collective benefits.	✓		