Supporting ANSPs with CPDLC implementation in Europe

“DO YOU NEED A PERFORMANCE AND COVERAGE EVALUATION OF CPDLC IN YOUR ATN/VDL MODE 2 INFRASTRUCTURE?”

Europe is now getting ready for a broad implementation of the ATN/CPDLC service to increase the Air Traffic Management capacity. NLR carries out validation flights for ATN navigation and communication systems. We operate a Cessna Citation II research aircraft from the well-accessible Amsterdam Airport Schiphol in the Netherlands. Our experienced team of experts will ensure that CPDLC application will be successfully tested to your needs in operational conditions.
Services
CPDLC in upper airspace is subject of the Data Link Services Implementing Rule (DLS-IR) of the European Commission see link: Regulation (EC) No 29/2009. For supporting this transition NLR can offer you the following services:
• The capability to execute test flights to evaluate the quality of service, the extent and continuity of CPDLC VDL Mode 2 and FANS-B coverage for your airspace according to specifications
• End-to-end test of new (versions of) avionics and novel technologies such as Multi-frequency VDL-M2
• Support you in all phases of research, development, test and validation

In-depth analysis tailored to your needs
• Recording in-flight behaviour of the datalink system at various levels of the protocol stack. This provides for characterization of many aspects of performance and stability of the datalink service
• Measurement of uplink signal quality (SQP) from all ground stations within range of the aircraft provides a good overview of the adequacy of VDL RF coverage. Gaps may become evident where no ground station provides adequate signal quality, possibly leading to excessive or unstable link layer handoff activity between ground stations.
• Unusual variation of signal quality with distance from a ground station may indicate poor siting or performance of a ground antenna, possibly due to shielding or other installation issues.
• Episodes of excessive overall VDL Channel Utilization recorded by the on-board VHF Data Radio (VDR) may indicate interference on the channel from non VDL sources.
• Detection of excessive downlink VDL link layer retries, in the absence of deficiencies in signal quality, may be associated with local issues such as co-site interference affecting specific ground stations.
• We can evaluate other issues as round trip message transfer and the behaviour of handoffs between different ground stations to maintain stable connectivity.
• Measurement of technical round trip application delays may point to systematic issues affecting performance of the overall end-to-end chain, potentially compromising continuity.
• Assessment of actual issues such as provider aborts and receiver deafness.

Aircraft
The aircraft used for the coverage flights is our Cessna Citation II research aircraft. The aircraft has a dedicated electrical system to support the experiment setup. Among others, a high quality antenna is installed underneath the aircraft specifically for Data link tests at a location providing low-interference from other aircraft antennae. In addition a high-accuracy positioning system can be installed on the aircraft. The aircraft is equipped with the required data link systems, evaluation interfaces and capable of recording customer specified data link and aircraft parameters in upper airspace.

Experience
From 2004 on NLR has a wide experience and knowledge on executing flight trials in an ATM environment. In previous years NLR has successfully executed flight tests for the EUROCONTROL Link2000+ programme to support the validation of operational CPDLC services and ATN/VDL Mode 2 infrastructure see link: http://www.eurocontrol.int/articles/link-2000-test-facility.

Personnel
Our experienced team of experts consists of qualified people like research pilots, flight test (instrumentation) engineers, R&D engineers, certifying staff, technicians and support personnel.

Quality
Our facility is subjected to regular inspections from the aviation authorities as well as to frequent audits required by our internal quality system.

Benefits
• Flexible and affordable flight test services due to unique facility in terms of organization and size
• Flight test organization with broad experience in executing ATM flight trials
• Wide range of supporting facilities, knowledge and personnel within NLR

AND YOU THOUGHT SIZE MATTERS? ...
SMALL AIRCRAFT, GREAT AFFORDABILITY!