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AN overview of the FLYSAFE datalink solution for the exchange of weather information: supporting aircrew decision making processes.

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FLYSAFE is an Integrated Project of the 6th framework of the European Commission with the aim to improve flight safety through the development of an avionics solution the Next Generation Integrated Surveillance System (NGISS), which is supported by a ground based network of Weather Information Management Systems (WIMS) and access points in the form of the Ground Weather Processor (GWP).

The NGISS provides information to the flight crew on the three major external hazards for aviation: weather, air traffic and terrain. The NGISS has the capability of displaying data about all three hazards on a single display screen, facilitating rapid appreciation of the situation by the flight crew.

Weather Information Management Systems (WIMS) were developed to provide the NGISS and the flight crew with weather related information on in-flight icing, thunderstorms and clear-air turbulence. These products are generated on the ground from observations and model forecasts. WIMS will supply relevant information on three different scales: global, regional and local (over airport Terminal Manoeuvring Area).

The Ground Weather Processor is a client-server architecture that utilises open source components, which include a geospatial database and web feature services. The GWP stores Weather Objects generated by the WIMS. An aviation user can retrieve on-demand all Weather Objects that intersect the volume of space that is of interest to them.

The Weather Objects are fused with in-situ observation data and can be used by the flight management system to propose a route to avoid the hazard. In addition they can be used to display the current hazardous weather to the Flight Crew thereby raising their awareness.

Within the FLYSAFE program, around 120 hours of flight trials were performed during February 2008 and August 2008. Two aircraft were involved each with separate objectives:

- to assess FLYSAFE's innovative solutions for the data-link, on-board data-fusion and data-display and data-updates during flight;
- to evaluate the new weather information management systems (in-flight icing and thunderstorms) using in-situ measurements recorded on-board the test aircraft.

In this presentation we will focus on the data link solution to uplink the Weather Objects to the NGISS. As part of the solution, a brief description is given on how grid data created by the WIMS are transformed to Weather Objects; which describe the weather hazard and are formatted using the Geospatial Mark-up Language.