

## JAL Expands Role in Atmospheric Observation Programme

**Tokyo November 10 2005:** From mid 2006 five Japan Airlines aircraft will be participating in an expanded global warming observation project to monitor greenhouse gases in the upper atmosphere (troposphere) using specially fitted air sample collection and measuring equipment.

Code named AMATRAS – for Atmospheric Measurement by Airliners for Trace Species - the new observation programme will involve five JAL aircraft measuring the composition of the upper atmosphere on JAL international routes such as between Japan and South East Asia and between Japan and Europe over Siberia.

The AMATRAS monitoring project is a joint effort also involving Tohoku University, the National Institute for Environmental Studies (NIES), the Japan Aerospace Exploration Agency (JAXA), the Meteorological Research Institute (MRI), JAMCO - a JAL Group aerospace equipment manufacturer - and the JAL Foundation, which is coordinating the project. Development work started on the new project in September 2003.

Special equipment developed for the new program consists of Automatic Air Sampling Equipment (ASE) and Continuous Automatic CO<sub>2</sub> Measuring Equipment (CME). Funding the development of this special equipment is Japan's Ministry of Education, Culture, Sports, Science and Technology.

The continuous measuring equipment will be installed in five JAL aircraft – two B747-400s and three B777-200s – by mid 2006. ASE equipment will also be installed in the two 747-400 aircraft. CME equipment will also be installed in an aircraft operated by JAXA.

The continuous automatic measuring equipment can measure the concentration of CO<sub>2</sub> from just after take-off to just before the aircraft lands. The samples taken by the automatic air sampling equipment will be analyzed to measure the concentration of greenhouse gases such as carbon dioxide, methane, carbon monoxide and sulphur hexafluoride.

JAL and JAMCO, with advice from the National Institute of Environmental Studies, developed the equipment, which required the approval of the Japan Civil Aviation Bureau (JCAB) prior to installation. JAL has also sought the approval of the Federal Aviation Administration (FAA) of the United States for the installation of the equipment and airplane modification required if the programme is extended to include other aircraft

Certification by the JCAB and the FAA of the first aircraft to be fitted with the equipment, a JAL 747-400, was completed on November 4. The installation included modification of the cargo compartment. Test observations of the

*<more>*

continuous automatic measuring equipment and the automatic air sampling equipment will be starting from mid November.

JAL has also recommended to Boeing the possibility of making installation provision of the continuous automatic CO2 measuring equipment in the Boeing 787 "Dreamliner" as a standard option for the new aircraft to promote its environment-friendly features.

The new atmosphere measuring project is an expanded version of a similar atmospheric observation programme started in 1993 using JAL 747 aircraft taking samples from the troposphere on scheduled flights between Japan and Australia twice a month. The JAL Foundation and JAL operated this project in cooperation with the MRI, with the support of the Ministry of Land Infrastructure and Transport (MLIT).

Samples collected in this earlier programme to monitor the effects of global warming were analyzed at the Research Institute of the Japanese Meteorological Agency in Tsukuba, Japan. Between April 1993 and March 2005 JAL made 262 sampling flights.

The two 747s used in this 12-year programme were equipped with automatic air sampling devices, which took samples at 12 points during the cruise at every five degrees of latitude between Australia and Japan, between 9,000 and 12,000 meters. The sampling equipment was designed, built and installed by JAL engineers.

The analysis of the results showed that:

1. Carbon dioxide (CO<sub>2</sub>), generated mainly at ground level in the middle and high latitudes in the Northern hemisphere, is carried to the upper troposphere.
2. The CO<sub>2</sub> generated mainly in the Northern hemisphere is carried to the Southern hemisphere
3. Carbon monoxide (CO) generated by forest fires caused by strong El-Nino phenomena appears to influence ozone concentration in the troposphere by reacting with other substances in the atmosphere.

The original global warming research project has drawn worldwide attention and it is hoped that the new programme will help improve the accuracy of global warming forecasts, helping to unravel the mechanisms of global warming.

JAL was the first major international scheduled airline to participate in such a long term, continuous and wide-ranging monitoring programme and the airline has been widely recognized for its initiative in taking part in this environment-monitoring activity.

<more>

The Nihon Keizai Shimbun, Japan's leading business and economic newspaper, awarded JAL its "GLOBAL ENVIRONMENT TECHNICAL AWARD", for the airline's contribution to this continuing troposphere observation.

In 1996 Japan's Minister of State at the Meteorological Agency awarded JAL the Agency's award for development of automatic air sampling equipment used in the programme.

In 1997 JAL was runner-up in the FLIGHT INTERNATIONAL AEROSPACE INDUSTRY AWARDS FOR 1997 for environmental activities, in particular for the upper atmosphere sampling project.

### **JAL and Greenhouse Gases**

JAL also conducts a number of measures aimed at reducing the amount of greenhouse gas emissions its business activities generate. Measures include the introduction of state-of-the-art fuel-efficient aircraft, accelerated retirement of conventional aircraft, greater use of flight simulators in place of aircraft, and increased use at the airport of Ground Power Units (GPU) to supply aircraft with electric power. For details on JAL's environmental activities please visit

[www.jal.com/en/environment/](http://www.jal.com/en/environment/)

###

