

## NASA Research Runs on Australian Software

Leading Aerospace into the next Millennium, the NASA Langley Research Centre in Hampton, Virginia has been instrumental in shaping aerospace history for eight decades. Established in 1917 as the first national civil aeronautics laboratory, Langley has become a comprehensive, world-class centre for aeronautics, atmospheric sciences and space technology.

The bulk of the research carried out at Langley is in aeronautics, working to improve today's aircraft and to develop concepts for future aircraft. The centre also supports the US space programs by conducting a dynamic program in atmospheric sciences, seeking a more detailed understanding of the Earth's atmosphere.

The centre manages high-payoff programs in atmospheric sciences, airframe systems, high speed research and advanced subsonics. NASA Langley is the agency's Centre of Excellence for Structures and Materials research, and is the focal point for wind tunnels and aerothermodynamic and structural test facilities.

The centre assess advanced concepts and proposed new systems prior to NASA commitment of major developmental funding. NASA Langley is the agency expert for airborne systems, aerodynamics, mission and systems analysis and hypersonic technologies.

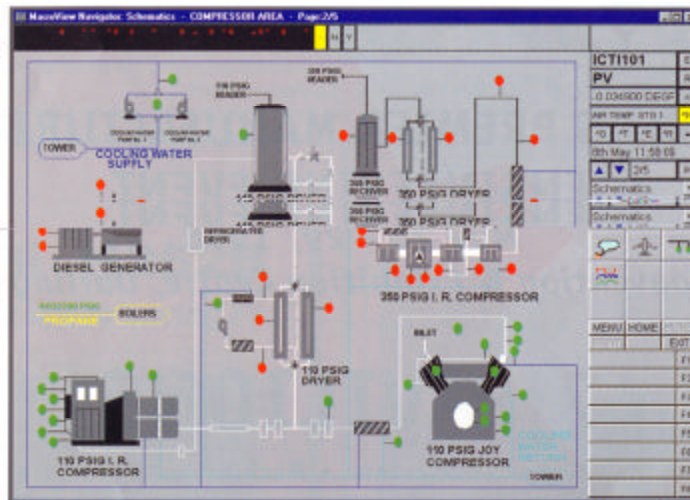
A feature of the facility is the number of wind tunnels including the Supersonic Wind Tunnel, which operates with a variable geometry nozzle that produces a Mach number from 1.4 to 5.0. This facility operates as a blowdown tunnel with air as the test medium.

To cope with the research demands of a new millennium, Langley is bringing on-line new research facilities including advanced wind tunnels and power generation facilities.

As part of this expansion program the NASA engineering team chose the newly released Windows NT® version

of the Australian software product MacroView for the SCADA control and management of the new power and steam generation facilities including boiler management. The MacroView system is being implemented in a dual redundant configuration in conjunction with Allen Bradley PLCs, using the RSLinx package, and a range of Yokogawa control equipment.

MacroView was evaluated against leading US products, and the



Windows NT®, Client Server version of MacroView was chosen. A remarkable feat for an Australian product, made even more remarkable given the fact that the MacroView release for NT evaluated was still in the beta stage.

The Client Server version of MacroView allows MacroView server software to run on a number of platforms including Sun Solaris, Digital Unix, SCO Unix and the Windows NT. The client software runs in a Windows 95 environment and maintains a local copy of the graphics and tag database to allow maximum efficiency in data throughput over serial and Ethernet interfaces.

A key requirement in the evaluation was for a software product optimised for the multitasking, 32 bit operating environment of Windows NT. It was found that in general the US products offered were originally written for Windows 3.11 (or DOS) and did not take advantage of the NT operating system.

MacroView was originally developed for the Multi-tasking Unix environment and had previously been delivered on 64 bit RISC machines. So with the

new version specifically developed for NT, MacroView was considered to be the product of choice.

The Langley Centre is home to the Flow Modelling and Control Branch, which is responsible for conducting fundamental experimental and computational research to enhance the knowledge and understanding of the physics underlying boundary-layer transition, turbulence, vortical and separated flows.

This understanding is used in developing advanced methods for the prediction of boundary-layer transition and in developing techniques for controlling viscous fluid flows. Advanced wind-tunnel and experimental test techniques are applied across the speed range from low subsonic to hypersonic speeds. A major goal of this effort is to transfer validated design tools and benchmark experimental data to NASA researchers and US Industry.

The Langley facility has been responsible for some major accomplishments in recent times including allowing aging aircraft to fly safer and longer through the use of non-destructive methods for finding structural disbands, cracks and corrosion. A growing number of airline pilots now have advanced warning of dangerous microbursts, a major cause of airline accidents in the 1980s. The centre also has a program to monitor the changes in the Earth's atmosphere, such as the ozone layer and also played a significant role in a number of programs including Apollo, Mercury, the Viking mission to Mars, the space shuttle and space station.

One of the applications for the newly constructed wind tunnel is testing on aircraft for the Hyper-X program, which will allow unpiloted jets to fly out of the Earth's atmosphere at 10 times the speed of sound, or 7200 miles per hour, by the end of the decade.