International Communications Satellite Systems Conference

Speaking Notes

For

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On behalf of the Canadian Space Agency, it gives me great pleasure to welcome you to Montreal and to the plenary session of the International Communications Satellite Systems Conference, the second time in its 34-year-history that the American Institute of Aeronautics and Astronautics has held this event in our city, Montreal.

During the next few days, our attention will be focused primarily on the future.

For just a moment, though, I would like you to think back to the not-so-distant past.

Little more than 90 years ago, American science fiction pioneer Hugo Gernsback lit the fire of human imagination with his prediction of radio transmission through space, a revolutionary notion, back in his 1911 space novel, *Ralph 124C41*.

Almost five decades would pass before radio signals, reflected from the thin aluminum surface of a plastic balloon called *Echo1,* heralded the advent of satellite communications.

It would take another five years to officially proclaim the satellite era with the launch in 1965 of *Intelsat 1*, the first commercial communications satellite to provide high-bandwidth telecommunication service between the United States and Europe.

We have come so far, so quickly, in this space-age odyssey it is easy to forget that the technology that carries our voices from one end of the world to another in just one-quarter of a second through a link 35,900 kilometers above the Earth is still a relatively new phenomenon.

This conference is officially designed to explore the technical challenges we face in the satellite communications industry, such as the development of high-speed access and improved coverage in areas where fibre connections are too costly to implement.

The conference also comes at a very propitious time for the Satellite Communications industry, as it faces several challenges mentioned by Chris Hoeber concerning the development of applications—be it the Internet, radio, television via satellite, or satellite communications probes designed to be propelled further and further out into our universe.

On a more lyrical note, I hope that we also will hear ideas that have the power to launch a thousand space novels, filled with ideas worthy of the vaunted Hugo award named in honour of the American sci-fi pioneer and visionary.

These are times that call upon pioneers and visionaries.

Like any dynamic and fast-growing industry, the satellite communications industry is in the midst of dramatic change.

Rapid advances in technology, convergence and intense competition require strategic adjustments on a continuously shifting playing field, in every sector of the Satellite communications industry.

As well, the combination of global deregulation and industrial consolidation that has sparked cross-ownership of European and North American companies has intensified the need for strategic partnerships and international collaboration in the pursuit of national goals.

Given the world in which we live, these trends are not surprising.

And given the pace of developments, it is clear that those without clear direction risk being left behind.

Satellite communications is a growth industry, and certainly the largest contributor of socio-economic benefits of Canada's Space Program.

For instance, in 2001, Satellite Communications garnered an impressive 63 percent of the Canadian space industry's annual revenues.

Without a doubt, commercial satellite communications is the lucrative cornerstone of the global space industry.

In 2000, it generated over $81 billion U.S. in annual revenues—an increase of 17 percent over 1999.

Satellite services, the largest and fastest growing segment of the industry, earned almost $40 billion U.S. in 2000, a 29-percent increase over the previous year.

The manufacture of satellite-related ground equipment, which includes everything from satellite control systems to dishes, accounted for almost $18 billion U.S. of the industry's total revenue, an increase of 11 percent over 1999.

Despite fierce competition from terrestrial systems, most analysts agree that satellites will retain a significant share of future markets for television, data, interactive multimedia, mobile and intercontinental point-to-point communications.

Still in its infancy, broadband multimedia satellite communications are expected to grow faster and larger than direct-to-home TV broadcast, which, in only four years, has attracted 1.5 million subscribers in Canada alone.

Just as the exploration of space has unlocked new frontiers, the phenomenal impact of the information and knowledge-based economy has opened new horizons here on Earth.

In conjunction with the use of frequency allocations at Ka-band, the rapid evolution of digital technology that provides higher data-rate transmissions and broadband services has sharpened the focus of satellite communications research and development.

At the same time, in the midst of unprecedented opportunity, the realities of a market-driven global economy have forced every space-faring nation, including Canada, to think long and hard about the priorities, about capabilities and, most particularly, about its own needs.

Canada is, above all, a pragmatic nation.

Our vast territory and low-density population pose economic and logistical barriers to the expansion of even the most sophisticated terrestrial facilities.

No wonder then, that the development of an advanced telecommunications infrastructure is as pivotal to our national strategy and economic growth as railroads were to the forging of this country in the nineteenth century.

From the beginning stages, Canada has carved itself an enviable role in the development of satellite telecommunications systems.

Finding affordable ways to bridge distance and conquer natural boundaries is important to a country like ours.

To reach across the immense, unpopulated solitudes that separate pockets of Canadian communities, our ancestors had to go around, over the top of, underneath and, in some cases, through obstacles as formidable as the Rockies and as impenetrable as the frozen Northern tundra.

Today, bridging distance in the information age—this time through space—is just as important to Canada's future.

Since the early 1960s, the Canadian Space program has recognized that adapting space-based technologies and processes for applications on Earth is the best way to surmount uniquely Canadian challenges, such as the vast distances and variety of landscapes and climatic conditions that define Canada.

Quite simply, we turned to space because it made sense.

The launch of our debut satellite, *Alouette-1,* in 1962 helped us investigate the adverse effects of ionospheric activity on radio communications, particularly in the far North.

We emerged from that program as a world expert on ionospheric phenomena.

In 1972, while looking for a way to connect communities scattered over our vast expanse, we came up with a national communications satellite system, *Anik A*, the first of its kind in the world.

As a result, *Telesat Canada*, the system's operator, is now one of the most experienced satellite control organization anywhere.

Today, the latest generation in the series, *Anik F-2,* will push the envelope even further.

It will bring specialized services, such as telemedicine, tele-education and access to e-commerce and high-speed Internet, to citizens living in urban, rural and remote communities throughout Canada.

Canada was the first country in the world to test the concept of a Direct Broadcast Satellite with the launch of *Hermes* in 1976.

Two years later, the world's first direct-to-home television satellite television beamed a Stanley Cup playoff game between Montreal and Boston into a Canadian diplomat's home in Lima, Peru.

That satellite led to a joint venture between Canada and the United States to implement a *Mobile Satellite System* able to reach citizens in the most remote corners of the country.

Today, we have shifted our sights from the design and manufacture of complete space telecommunications systems to concentrate instead on the development of key niche markets that will ensure our spot at the leading edge of development and technology.

As a result of strategic programs funded by the Canadian Space Agency, Canada has established a solid industrial base of internationally competitive companies.

Our industry supplies an array of satellite communications subsystems and services, components to spacecraft manufacturers, as well as mobile and fixed earth terminals and complete ground systems.

Yet, like other countries, Canada has had to make hard choices.

At every turn, our Satellite Communications strategy is hard-wired into the long-term national agenda to focus on specific areas of strategic importance to the economic and social well being of Canadians.

Central to that strategy is our role as the engine that drives the national *Connecting Canadians* initiative, launched in 1997 by the Government of Canada with a goal of making Canada the most connected nation in the world.

Anyone who doubts the necessity and value of this ambitious program need only accompany me to the EMS/CRC booth at 10 o'clock this morning for *Telesat's* downlink

with children from three schools in Quebec, one of several demonstrations during this conference.

This SchoolNet demonstration will showcase next-generation services and technologies that will be available across Canada when Anik F-2 is launched in June 2003.

This is the kind of Canadian technology that, in 1999, turned Canada into the first country in the world to connect its public schools and libraries with the Internet.

It is also an illustration of the innovation and expertise that will take the communications sector in this country to a new and exciting level.

Satellites and space infrastructure are critical components of the *Connecting Canadians* strategy.

Much of the initiative's success will depend on our industrial sector's ability to commercialize innovative communications technologies and services and capture new markets on a global basis.

That, in turn, depends largely on our ability to foster a perpetual loop of research and development that capitalizes on the wealth of talent that exists in this country.

Satellite Communications is well worth the investment.

Significantly for countries like Canada, performance analyses indicate that satellite communications may return anywhere from $10 to more than $30 for every R&D dollar that we spend.

However, capitalizing on opportunities requires a coordinated effort.

As the steward of Canada's civil Space Program, the Canadian Space Agency is the central hub of an industry of more than 250 firms across Canada employing nearly 6000 skilled workers.

The Canadian space industry generates about $1.4 billion in annual revenues, with 46 percent of it derived from exports.

Although more than 75 per cent of our budget is spent in Canadian industry and on the university research community, nearly every project of consequence we undertake is done in partnership, whether it be with other government departments and agencies, like the Communications Research Centre Canada, or with international partners, including of course our close ties with NASA and the European Space Agency.

Fostering relationships with like-minded international colleagues has revitalized the Canadian space industry at every step of its development.

For instance, Canada's 20-year partnership with the European Space Agency has given us an ideal platform from which we can share expertise, promote our space industries abroad and spur the creation of jobs at home.

No where is this more evident than in the long-standing synergy we share with the European Space Agency in the development of a range of key satellite communications technologies.

Our collaborations range from the development of onboard antenna systems to make satellites more energy efficient, to the participation in ARTES programs, including the Galileo global positioning and navigation satellite system.

Together, we have worked on digital and advanced transmission techniques to provide faster and cheaper services with greater capacity to handle high-speed digital communications, Internet, direct broadcasting and other multimedia applications.

Indeed, Canada's development of a Ka band multimedia communications satellite payload will be a key component of the $600 million ANIK F2 satellite.

The Canadian Space Agency has partnered with Telesat Canada, COM DEV International and EMS Technologies to develop, deploy and operate a Ka band multimedia payload on board Anik F2.

This collaborative effort will allow us to achieve our objective of developing and demonstrating leading multimedia payload technologies.

It will also advance our telecommunications infrastructure so that we can overcome the current barriers and provide Canadians with full access to broadband networks and help bridge the "last mile" in the most remote regions of our country.

Projects like Anik F2 represent a new way of targeting resources for research and development that serve multiple goals and are better suited to the needs of specific satellite applications.

Increasingly, for instance, satellite payloads will be designed into total end-to-end systems, replacing the so-called "bent pipe" approach, where the sole function of the satellite is to receive signals and re-distribute them without any change or processing.

No longer will it be feasible to launch general-purpose satellites and rely on ground segment innovations to define the applications supported by the satellite.

Together with specific earth terminals and network management systems, future satellite payloads will form an integral part of an incorporated system of multiple satellites using a single orbit location.

To meet our goals in the coming years, Canada recognizes the need to develop a space infrastructure that will ultimately grow into an interconnected cluster of highly flexible communications satellites.

Of course, clustering satellites is not a new phenomenon. The *Société Européenne Des Satellites* has successfully developed a broadcast service in Europe at 19.2 degrees east by adding new, unconnected satellites to the same orbit slot on a regular basis.

Such a Geosynchronous Satellite Cluster is based on the premise that each of the cluster satellites provides a customized footprint and service on the earth, while forming one node in a distributed management and switching backbone in space.

By increasing flexibility, new satellites connected into the orbit management system could change their basic function according to need.

This is not the stuff of science fiction.

Nor is it a projection of some far-off scenario.

In the not-so-distant future, each one of us will likely look back on this time and realize that it was the natural evolution of an industry that has only begun to realize its full potential.

Thank you.