

MPDS launches new era of communications

With the new comprehensive AES communications system now entering its primary operational phase, Zephyr zeroes in on one of its most handy and visible aspects — the brand new technology of the Multi-Purpose Display System (MPDS). John Schneider describes it from the point of view of the project manager, in on the scheme from day one while Andy McCullough of Windsor Weather Office, also familiar with MPDS, describes how the system will be of great benefit to him as a presentation technician. Bruce Attfield, director, Computing and Telecommunication Services Branch, rounds out the feature by looking at MPDS within the perspective of the new communications system as a whole. Other aspects of the new wave in AES communications will be presented in future issues.



The photo shows the AES METSIS installation at Calgary used to provide satellite communication of weather products for the special weather office set up during the Winter Olympics in February, 1988. Nearly all of the 70 METSIS sites across Canada are now operational. They form part of the AES New Communications System of which MPDS is another major component (Please see articles inside).

87 MPDS systems delivered to AES

by John Schneider

The MPDS (Multi-Purpose Display Station) Prototype Development Project was approved in the fall of 1984. The objective was to provide a soft copy display of satellite photos for Weather Offices across Canada. The design also considered the eventual replacement for the existing Facsimile Network recorders.

A preliminary study specified existing operating procedures and listed user requirements that existed at weather offices across Canada. A feasibility study and the functional specifications were completed the fall of 1985. The initial prototype system provided the weather briefer with the following services:

- Automatically receive and store satellite images, radar and weather charts from METSIS (Meteorological Satellite Information System), a satellite broadcast network linking all weather offices across Canada.

- Improve the visual quality of the received imagery by displaying softcopy images in black and white, grey scale or colour as suitable, with higher resolution than the existing hardcopy output technology. Provide low resolution hardcopy output.

- Provide the briefer with the means to perform image manipulations, overlays, zoom, pan, scroll, scaling and animation.

A prototype hardware and software development contract was awarded to Hewlett Packard (H.P.) and Northwest Digital Research Ltd. (NWDR) in early 1986. The hardware consisted of a H.P. 9000, series 310 computer running a Pascal operating system. Northwest Digital Research supplied a proprietary software package called VIEWSTAR.

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Awards go to two DGs, two outstanding staff

Accomplishment was the theme of a special gathering held in the AES Downsview Headquarters auditorium on May 26.

Crediting AES as a whole, ADMA Howard Ferguson first told his audience of some major AES achievements during the past year. These included international scientific leadership leading to the Montreal ozone protocol, the first global environmental protection agreement, outstanding AES performances in organizing special weather services for the high profile Calgary Winter Olympics and highly commendable AES action in dealing with the disastrous Edmonton Tornado.

Mr. Ferguson added that it was no mean feat for AES to have remained within its annual 1987-88 financial budget and to have stayed within 0.7 person years of its staffing allocation.

ADMA also mentioned upcoming challenges such as the World Conference on the Changing Atmosphere and the implementation of the AES Strategic Plan.



Left to right: Dr. Ian Rutherford, ADMA Howard Ferguson, Jim McCulloch.

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York University congratulated on new chair

At a well-attended ceremony held at York University on February 5, Environment Minister Tom McMillan sent a good will message on the occasion of the announcement of the new NSERC/AES Research Chair in Atmospheric Chemistry.

The message was read as part of a speech by ADMA Howard Ferguson chief AES representative at the gathering.

Relaying the minister's words, Mr. Ferguson said that ways in which top scientists could assess the threats to our fragile environment included holding major meetings like the Conference on the Changing Atmosphere, due to be held in Toronto June 27-30 and establishing research facilities at Canadian universities where scientists can study environmental issues away from the glare of publicity. "The more world-class research we are able to perform in atmospheric chemistry, the



Left to right: ADMA, Howard Ferguson, Dr. Hironi Nicki chairholder and Dr. A. W. May, president of NSERC.

better equipped we will be to protect our life-sustaining atmosphere", concluded the ministerial message.

Adding to the Minister's thoughts, Mr. Ferguson said that AES was particularly pleased that a scientist of the calibre of Dr. Hironi Nicki had accepted the Research Chair. "The creation of the Chair at York is an excellent beginning", continued Mr. Ferguson. "AES has been pleased to cooperate with the National Science and Engineering Research Council and to recognize York's existing expertise and potential. I would emphasize that AES's financial commitment of half a million dollars over five years is provided from reallocation of existing budget resources. In these days of federal belt-tightening, we believe the AES financial commitment to York and other Canadian Universities is significant."

The Minister's message was addressed to Mr. R. Bruce Bryden, Chairman of the Board of Governors of York University, who acted as master of ceremonies during the Chair announcement.

Clock in DG's office dates back to Napoleon

by Jerry Skala

When visitors drop in at the office of the director general of Central Services in Downsview, they often ask Gord Shimizu about the elegant old clock standing in the corner.

He is proud to explain that it is a regulator clock made in France around 1800 and one of the very few of its type to find their way to North America. In fact it has an interesting history . . .

The first clock of this type (with glass door and long wooden case) was designed and built by Jean Antoine Lepine, clockmaker to French King Louis XVI. Calculations and assembly began around 1785.

Lepine came to Paris from Switzerland at the age of 24 and became a friend of Voltaire. He soon learned that it could take up to 20 years to calculate the movements for a really complicated astronomical clock and another 12 years to construct it. The best clockmakers in France were given lodgings in the Louvre by the King and were treated as artists. They dined in the Palace with the Gentlemen of the Chamber and had rights of entry to the King's presence.

By the end of Louis XVI's reign and during the First Empire some very fine 'regulators' were made — and this includes the one in Mr. Shimizu's office.

In general, French clockmakers did not adopt the recoil anchor or dead beat escapement method, universal in England. Instead they used various forms of pin wheel escapement introduced by another clockmaker called Amant who worked in Paris between 1730 and 1749. The AES regulator has this pin wheel escapement as well as a temperature-compensated pendulum. This latter is a device that dates back to early 18th century England and consists of nine iron and brass rods with different coefficients of thermal expansion to allow for temperature variation.

The AES regulator clock was completely re-serviced a couple of years ago by myself and other AES technicians.

In the days when the Meteorological Service was located on Bloor Street West, Toronto, near the

University, it was used as the official time-piece of Canada's Weather Service. As one of the earliest pieces of equipment it was in use during the entire period at the building, from 1907 to 1971. During most of those years the Dominion observatory in Ottawa sent time signals via telegraph wire to the Toronto headquarters and our regulator clock was compared with it.

The AES regulator is one of the finest examples of the clockmaker's art and it still keeps correct time to within a couple of seconds every day.

Mr. Skala is a recently retired calibration technician with Central Services in Downsview.



The old French clock is so accurate, Central Services Directorate employee Bill Kiely (Audio Visual coordinator) is able to set his watch by it.

June 23, 1980 A tornado and hailstorm near Yorkton caused \$1.6 M in property losses including the skating rink at Francis, Sask.

June 17, 1946 A tornado skirted along the southern edge of Windsor and moved out over Lake St. Clair; 16 killed, hundreds injured; damage was estimated at \$1.5 M.

ZEPHYR

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During a recent meeting between senior officials of AES and the Department of Transport (DOT) Mr. Gilles Rodrigue (right), director of Air Navigation System Requirements, DOT, presented a plaque to J. Real Gagnon in recognition of his six years as AES's liaison officer with DOT. In presenting the award on behalf of his deputy minister, Mr. Rodrigue noted several areas where Real had made a noted contribution to improving AES/DOT relations.



Left to right: Tom Hacking, ADMA Howard Ferguson, Cal Carter.



Audrey Scott, Pay and Benefits clerk with Pacific Region (Vancouver) recently received a 25-year Long Service plaque from ADMA Howard Ferguson.



A little earlier this year, the deputy minister took the occasion to present a 25-year Service Award in AES Western Region. In this picture Dr. Sainte-Marie is seen congratulating Alberta Weather Services supervisor Gerard Langevin (centre) on his long and effective service in the Region which included early postings all over Western and Northern Canada. He joined the Alberta Weather Centre in 1980. Looking on is Brian O'Donnell, regional director, AES Western Region.



Pictured above left is Leonard Szarko, Ontario Region electronics technician accepting a Suggestions Award for three recommendations for Weather Radar Systems. Phil Aber, Ontario Region director, praised Leonard for his initiative leading to improvements in the performance, reliability and safety of the network.

PLEASE NOTE: during the past month or so we have received a large number of items about awards and achievements, particularly in the AES regions. Unfortunately, for space reasons, we will not be able to include all the contributions in this issue, but will do our best to fit them in later this summer.

Awards go to two DG's

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Accomplishments by two AES directors general were recognized in the form of Long Service Awards handed out to Jim McCulloch (D.G., Canadian Climate Centre — 35 years) and Dr. Ian Rutherford, (D.G., Weather Services Directorate — 25 years). Mr. Ferguson pointed out that Jim McCulloch was nearing the end of a long and distinguished career, which he began as a forecaster in Goose Bay, Labrador and which included stints as a director general in three different AES directorates.

Mr. Ferguson said that Dr. Rutherford had also started out as a forecaster at Goose Bay, had held senior scientific and administrative positions at the Canadian Meteorological Centre in Dorval, Que. and had occupied the position of Director General of two AES directorates (Research and Weather Services). ADMA added that Dr. Rutherford would be moving to the National Parks Service in Ottawa as director general in July for one year before returning to AES.

Winner of the prestigious J. P. Bruce Award was Calder Carter of Finance and Administration Branch. Mr. Ferguson praised Mr. Carter for his work as financial advisor to himself and to several of his predecessors. He added that he had worked extensively, beyond normal hours without compensation or overtime and had given many years of dedicated, high quality service. Mr. Carter also received a Public Service Merit Award.

Also receiving a Merit Award was Tom Hacking of Data Acquisition Services Branch (Downsview). ADMA praised Mr. Hacking for his work "beyond the call of duty" in assembling and restoring a priceless collection of historical meteorological instruments, many of which had now been transferred to the Museum of Science and Technology and "had contributed significantly towards the scientific and cultural heritage of Canada".

Mr. Ferguson conveyed the regrets of the Deputy Minister, Dr. Geneviève Sainte-Marie, who had intended to come and present the awards herself but had been unable to do so because of a last-minute emergency which kept her in Ottawa.

Appointments

Dr. Ian Rutherford has accepted an assignment with the Canadian Parks Service as director general, National Parks Bureau, at headquarters. Dr. Rutherford has been director general, Weather Services, with the Atmospheric Environment Service in Downsview. His assignment begins 4 July for a duration of one year.

Ian Rutherford succeeds Bruce Amos, who has been acting director general since last November when Pat Thomson was named to co-ordinate development of South Moresby National Park Reserve in British Columbia.

Other AES staff changes include the appointment of Francois Lemire as director, AES Quebec Region and Hubert Allard as director of the Canadian Meteorological Centre in Dorval, Que.

An overview of new telecommunications

by Bruce Attfield

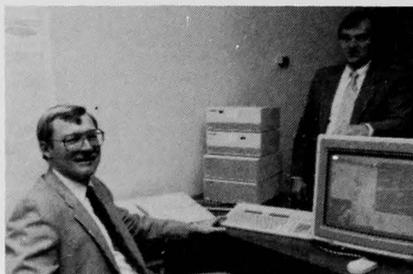
AES is now completing work on its replacement of the telecommunication network that supports the Weather Services Program. This development represents the most complex technological project ever tackled by AES.

In 1980, study of the aging telecommunications network concluded that expansion to keep up with the ever-growing demand for more weather information was not possible. The system had served AES very well for 25 years or so and data availability and quality were still increasing, but the system could no longer cope and a change was essential.

In 1982, Treasury Board approved a project designed to make use of cost-effective public packet telecommunications plus Canadian telecommunications satellites for pictorial information transmission.

The safety and security of Canadians was the first consideration without regard to cost or concern for their geographical location. The system would be no more expensive than the old one and would provide a flexible, cost effective growth path for future requirements.

Despite some interim setbacks during six years of planning and installation, the system is now ready. Credit must go to the staff of the Planning and Development Division of AES's Computing and Telecommunications Services Branch under Mitch Kallaur as well as to many



Project leader John Schneider (left) smiles now that most of the initial planning phase of MPDS has been completed. Director of Computers and Communications Bruce Attfield looks on.

others across AES, and to private sector consulting firms.

AES's Operational Systems Division (OSD) has taken operating responsibility for the new network, though actual system turn-on will occur gradually over the next few months. A new National Computer Communications System (NCCS) will be completed this summer with new terminal equipment reaching all AES sites. The NCCS completes the first half of the new system objective.

The second half provides the broadcast capability. The Meteorological Satellite Informa-

tion System (METSIS) is also nearing completion and is presently broadcasting duplicates of the information disseminated by the old system. All AES weather offices now have the capability of receiving data via Canada's ANIK satellites.

The newly converted offices will continue to receive pictures on paper facsimile like they do today. However, the true benefit of the delivery system will be felt as AES installs its display equipment this summer. The Multi-Purpose Display System (MPDS) has been designed by AES and employs modern workstation computer equipment and Canadian developed software. Those who have seen it say it is very advanced and compares most favorably with other systems used by weather services around the world. MPDS is the key to full use of AES's new METSIS system and its operation is described more fully in the accompanying Zephyr articles.

As a measure of success it is worth noting that not only does the new system deliver more and better quality information in shorter time-frames, it uses less resources than the old system. The new system operates for fewer 1988 dollars than the old system did in 1981 dollars.

Mr. Attfield is director, Computing and Telecommunications Services Branch, AES Downsview.

The Great Outdoors Goes High-Tech

by Mike Newman

The eighth biennial B.C. Yukon Scout Jamboree was held at Camp Bernard, Sooke, B.C., last August. There were approximately 1,900 scouts and leaders and over 600 aides from B.C. the Yukon, the western United States, Japan, Hong Kong and Australia.

Through my association with Scouts Canada I was asked to provide a weather display as part of a group of activities called the "The Great Outdoors".

"The Weather Station" was set up in an open-sided cabana and consisted of the regional modular display, depicting some of the equipment used in weather forecasting. Picture displays showed Pacific Weather Centre facilities and some satellite images. A video display and computer system were also displayed.

Each day the weather presentation began with the 12 minute video "The Vancouver Weather Station Tour" and included a brief explanation of our forecast system, how satellite imagery is used and some of the weather signs that herald changes in the weather. PR material was also handed out. Three evening workshops were held for leaders with suggestions on how to arouse an interest in weather-related topics, where to get more information and how to build simple weather instruments.

Each evening from 8:30 till 11:00 a full length weather documentary was shown. Due to the interest sparked by the Edmonton tornado in July, the documentary was held over for three nights.



Mike Newman demonstrates his weather station at scouts' jamboree.

Except for one night of rain, weather conditions were perfect: clear skies, maximum temperatures in the mid-twenties and minimums in the low teens. Since the station was one of the few shady spots and seating was provided, it was a very popular place to rest.

During the six days of the jamboree more than 1,400 people took advantage of the presentation and many stopped to look at the static displays and evening movies.

As with any successful event there were many people who provided enthusiastic support: Victoria Weather Office O.I.C., Norm Dressler; chief of Weather Services, Pacific, Fred Herfst; project meteorologist, Tom Gigliotti; operations development technician, Bob Loveless; and executive director Greater Victoria Region, Scouts Canada, Glen Barned.

Mr. Newman works at the Victoria Weather Office.

87 MPDS *cont'd from page 1*

The development of meteorological application software, field testing and evaluation took place over a one and one-half year period with final hardware specifications for the operational system taking place in the summer of 1987.

A Request for Proposal for the supply of \$3.8 million of computer hardware was issued by the Department of Supply and Services (DSS) to computer vendors in the fall of 1987. A contract was awarded to Hewlett Packard in February of 1988, with the delivery of 87 MPDS systems to the AES Downsview on March 31st 1988.

The MPDS hardware is scheduled for shipment to the Regional Weather Centers by late May, with Training of Regional personnel scheduled for early September and installation at all sites completed by November 1988.

The resultant MPDS system will greatly improve the physical work environment in the weather offices. It will provide quality information at much greater speed through high speed satellite communication links, therefore improving the availability and quality of weather information to Canadians.

Mr. Schneider is the project manager for MPDS AES, Downsview.

Why I look forward to MPDS

by Andy McCullough

John Schneider approached me one day while I happened to be working at AES Downsview and put the question, "How would you like to be on the MPDS PCC?"

I didn't understand at first, so he explained, "It's a new computer workstation being developed for presentation technician use in weather offices. I think you'll be impressed".

That, over two years ago was my introduction to the Multi-Purpose Display Station as a member of the project client committee. In consultation with project manager John Schneider and the company selected to develop the software — Northwest Digital of Burnaby, B.C., I had the opportunity of watching this program evolve into its present state of "ready to deliver".

What is MPDS? It is the downlink end of the Meteorological Satellite Transmission System (METSIS) which will replace the current weather map facsimile that has been operating for decades. It will introduce weather satellite imagery to all WO4S. It will permit the display of real-time radar pictures in all offices with such a requirement. Lastly, the hardware selected to perform all of these functions will help automate many routine tasks currently required in daily weather office procedures.

The same hardware could eventually be programmed to accept alphanumeric print-outs if required and thus take the place of many current computer terminals across the country. Fortunately, the hardware selected for MPDS is compatible with that of the forecaster work station and therefore will blend perfectly into the new Weather Service Offices under the Strategic Plan.

Why does all this excite me as a briefer? Because, I guess like all good people, I'm basically

lazy! What I have seen so far is a system which will permit me to do my job better, more quickly and much more accurately. Instead of the mundane routine of tearing, organizing, analyzing damp fax maps I will now have to simply push a couple of buttons and select the charts that please me after first having the opportunity to size and orientate these products to suit my pleasure — unless of



Meteorological technician Andy McCullough of Windsor, Ontario is glad that the frustration of unfurling bulky, damp weather maps will soon be over.

Operational MPDS Specifications

- H.P. 9000 Series 330CH
- 16.6 MHz 68020 CPU, 68881 coprocessor
- 8MB RAM, 10 planes 1280x1024 res.
- 19" display
- kybd, mouse, tablet A3 size
- 130MB fixed disk, high speed disc interface
- system slot expander (4 slots)
- dual 3-1/2" double sided flex disks (710 kbytes)
- cartridge tape drive 1/4"
- UNIX, x Window System
- METSTAR NWDR proprietary software (250,000 lines of code)
- AES meteorological application software (50,000 lines)
- PDI cards (56kpbs²) for METSIS interface
- Laser jet printer

course I'm too lazy to do even that. If so, I could program the computer to make all these pre-determined decisions for me. I also look forward to finally using satellite pictures to help me do my job more effectively.

True, I happen to be at a location that has real-time radar, but it will be a great pleasure for the first time to bring up a radar image alongside a current satellite picture on my 19 inch high-resolution color monitor and go over the data with an aircraft pilot by my side.

Yes, it's a lazy man's technology, but don't get ready to relax or retire. In my opinion this new equipment will not put any of us out to pasture. Rather, it will catapult us into the 21st century and permit us to service our consumers in ways we only dreamed of a few short years ago.

Lively happenings in remote Iqaluit

What do the following have in common: Valentine's Day, Careers Day at a local high school, and a special request from a Japanese university professor?

The staff at the Environment Canada Weather Office in Iqaluit — the only such office on Baffin Island — will tell you that all three were opportunities to demonstrate AES savoir-faire and show how meteorology can be of help to users and to the general public.

Here's what happened:

It was the night before Valentine's Day, and briefing technician Jacques Pelletier was starting his shift, little suspecting what would happen in the next 48 hours.

This year, Valentine's Day ended with a severe blizzard that paralysed the whole town for three consecutive days. Nothing like it had been seen for ten years.

Low visibility kept people at home and prevented almost any kind of outdoor activity. Two metre high drifts were everywhere. It soon became

clear that there would be no change of shift at the airport, and Jacques had to resign himself to doing the weather watch by himself, along with all the other functions of the weather office. He spent almost 47 consecutive hours at work, answering some 450 telephone calls, analysing 68 weather charts and making 72 surface observations.

Ironically, Jacques had just put the finishing touches on a study of the impact of blizzards. This study, which he carried out in co-operation with Gilles Brien, was designed to provide a comprehensive overview of the social and economic consequences of blizzards in a partly developed setting such as exists at Iqaluit. When a blizzard hits this community of 3050, the loss according to the study is \$130,000 per working day.

Blizzards are fairly common in Iqaluit, which explains the local saying that the four seasons here are the beginning of winter, the middle of winter, the end of winter and next winter.

As a result of the government's privatization

policy, many weather stations are being converted to contract stations, and Inuit residents are becoming more and more interested in careers in meteorology.

When the weather office received an invitation to participate in the local high school's Career Day, the staff did more than just provide the students with information: briefing technician Gilles Brien, assisted by trainee Lazarus Ageeagok, made a video about the various aspects of weather work, with a sound track in Inuktitut.

This was the only Careers Day presentation given in Inuktitut, and the effort was very much appreciated by the young visitors. The initiative is certain to have awoken the interest of budding meteorologists and weather technicians.

Not content with just serving their local community, the staff at the Iqaluit weather office were quite prepared to take the good word to the other side of the world, to a professor of international studies at Hokkai Gakuen University in Sapporo, Japan.

Professor Tosimi had asked for the exact pronunciation of the name of a community in Northern Quebec. Instead of sending him a short

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Excerpts from an Olympic Diary

by André Lachapelle

Once or twice during the careers of many AES employees. There are intense periods of action and excitement, punctuated here and there with short bouts of humor. When the project is over, few can recall the myriad details that occurred with lightning speed during the assignment. Fortunately, a few keep diaries of their experiences, and can make them come alive again to "outsiders". As a special feature, Zephyr presents two "Action Diaries", the first by André Lachapelle who held the demanding post of manager of AES's Olympic Weather Support Group at the recent Calgary Winter Games; the other by Dennis Engemoen, technical officer, AES Pacific Region, who participated in an international experiment over the Eastern Pacific last year called *Ocean Storms*.
see page 11.

Feb. 1 — Olympic Weather Support Team assembles in Edmonton. Training begins.

Feb. 4 — Team travels to Calgary. Accreditation Day. No mean feat! Minor intrigue when Steve Todd, of the United States National Weather Service, was refused a security clearance. Fortunately, it was a case of mistaken identity.

Feb. 5 — Venue briefers were given various boxes of PC's, paper and supplies and sent off to establish their respective domains at Canada Olympic Park, Nakiska and Canmore Nordic Centre.

Feb. 6 — Drove to Canmore and Nasiska to see venue set-ups and check communications procedures. Mike Collins, venue supervisor, was alerted to significant snowfall anticipated to occur overnight. Got an early start to providing weather support to Games.

Feb. 7 — First day of operations.

Feb. 8 — Media has picked up our scent. Federal Olympic Office finally manages to have most of the team clothing ready (jackets, turtlenecks, toques, but no ties yet).

Feb. 9 — Media hot on our heels.

Feb. 10 — It is still cold in Calgary. The company car starts well first thing in the morning, but following breakfast our morning briefer is unable to get it started again. On top of that, he manages to lock the keys inside. André Bellocq arrives from France (where the 1992 Winter Games will be held) to observe our set-up.

Feb. 11 — OCO'88 is concerned about the Opening Ceremonies; wind could play havoc with the inflatable mountains, the 60,000 ponchos, one of which is to be placed on each seat and the 100 hot air balloons. Snowfall could also be a problem since it would have to be removed from the 'staging snow'.

Feb. 13 - Watched some of the Opening Ceremonies on T.V. At the evening Alpine Team Captains meeting got accosted by the Chairman of the Alpine Events regarding the 3-5 cm of snow that had already fallen at Nakiska; this was later upgraded to 3-5 inches. RCMP at Nakiska responded that they had actually received 1-1.5 cm.



André Lachapelle

Feb. 14 — Chaperoned a CTV crew while they took footage of chinook arch from the rooftop. The hot air balloons were able to get off the ground in the west end and due to the southwest flow they drifted right over the airport and shut it down for a while. Men's downhill at Nakiska literally blown away and re-scheduled for tomorrow.

Feb. 15 — At Nakiska, the Albertville, France committee asked André Bellocq, if the downhill could be blown off the mountain in Grenoble '92 as it had been yesterday. Early in the morning, winds were still quite strong at Nakiska. We were calling for the winds to die down around 10 am. which they did. The Alpine types were quite impressed.

Feb. 16 — The Unifax was acting up, there were concerns about the Multi-Purpose Display Station (MPDS) and the data from the top of Nakiska went missing for two hours.

Feb. 17 — I had tickets for ski-jumping at 1:30 pm. Based on our forecasts at 10 am., the event was postponed until the following day.

Feb. 18 — At 1:25 pm., 5 minutes before the start of the jumping the winds picked up again. After nearly two hours, the 90 metre Team Jumping was cancelled and re-scheduled for the 24th.

Feb. 19 — Numerous and lengthy discussions took place between OCO '88 and our forecasters concerning tomorrow's 90 metre Ski Jump. Results: postponement of the jump until Monday the 22nd. This change was the most significant impact our service has had on a single event thus far. Winds strong enough today to justify the postponement of the ski jump.

Feb. 21 — I was off to watch the two men bobsleigh which was also postponed about one-third of the way through due to dust blowing on the track. Discussions between ourselves and OCO resulted in a one-hour postponement of Monday's 90 metre jumps in the hope that the winds would die down.

Feb. 22 — Began compiling some statistics on the February winds in Calgary since 1950. OCO plans to release the information at their Wednesday morning news conference.

Feb. 24 — Tom McMillan toured our office today in the afternoon. I began taking photographs of the team members and discussing wind-down procedures with Bruce Thomson. He and I then prepared a short questionnaire to be completed by venue and sports officials.

Feb. 27 — Two days to go and the world is falling apart. Datapac dies, and so do the Unifax and METDAS. Meteorological Data Analysis and Display System Datapac and METDAS are eventually revived.

Feb. 28 — Bruce Thomson and I went to Canada Olympic Park to watch four men bobsleigh and then to pack up the venue office. On to Canmore when the last event began at 3 pm. Waited until 3:30 pm., then we cleared out. Back in Calgary by 5 pm., proceeded to have a 'closing ceremonies' bash.

Feb. 29 — Most people have gone their separate ways. Bruce Thomson and Mike Purves around in the morning then they headed north in the afternoon. Reinhold Winterer and Ken Nelles remained to help disconnect and pack computers and other sundries.

The End (Almost)

Mr. Lachapelle was manager of AES's Olympic Weather Support Group.

Pick A Number Any Number!

Number of times lightning strikes the CN Tower each year: 65

How many people see the same rainbow: 1

Number of times more men are struck by lightning than women: 5

Number of Canadian households with snowblowers: 1,089,000
Air conditioners: 1,689,000

Average number of Canadians who die each year from exposure to extreme cold: 108

Number of professional weather forecasters with Environment Canada: 587
Women meteorologists: 52

Amount of money the Canadian government spends per person per day on the weather service: 2¢

Number of universities in Canada that teach meteorology: 7
In the United States: 94

Number of major weather stations in Canada that

take hourly weather: 245
In the world: 10,000

Number of tiny cloud droplets in an average size raindrop: 1,000,000

Percentage of Canadians who are comfortable with temperatures reported in Celsius: 66

Number of forecasts issued each year by Environment Canada's weather service: 800,000
Calls received for weather forecasts: 20 million

Average number of thunderstorm days in Ottawa a year: 24

ATMOSPHERE PEOPLE

Meteorologists are experts in meteorology, environmentalists care deeply about the environment, oceanographers are immersed in oceanography, but there just isn't a word for people who get involved with the atmosphere.

Henry Hengeveld, who for the past six years has been advisor, Carbon Dioxide Related Matters at AES Downsview, bandies one or two invented words about: "atmosographer", "atmosphile". But he soon laughs them off. "By profession I'm a climatologist . . . my speciality is CO₂ and the greenhouse effect", he explains.

Henry adds that his connection with the atmosphere could be regarded as an expansion of his outlook, very necessary in 1988, since it's the year of the big World Conference on the Changing Atmosphere (Toronto, June 27-30). For the past nine months Henry has spent less time on CO₂ and has become a very active member of the Conference Secretariat, located in the "basement" of the AES Downsview building.

The work has been varied and challenging . . . some involvement with "high level diplomacy", quite a bit of administrative work (which doesn't appeal to Henry that much) and the chance to be a media spokesman for the Conference in the Globe and Mail and on radio and national TV.

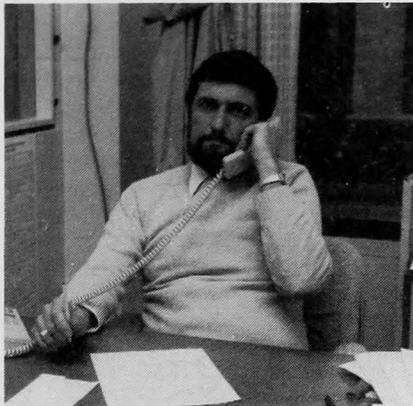
All in all, Henry seems tailor-made to be an atmosphere person. He was brought up on a dairy farm in Fenelon Falls, Ont. where he enjoyed a very close relationship with atmosphere and weather. In fact, his closeness to the atmosphere was so meaningful, he remembered it during his whole period of science studies at the University of Toronto (where he obtained both a B.Sc. and an M.Sc. degree). When the time came for him to select a career, he unhesitatingly chose meteorology, joining the Meteorological Branch of the Department of Transport in 1968.

By the time the Branch had been incorporated into AES in 1971, Henry had pursued further studies in remote sensing and had joined the Ice Branch as a remote sensing meteorologist.

During the following nine years, he absorbed a wealth of ice data and expanded his horizons to take in the entire weather and climatology of the Canadian Arctic. He was content to be based in Toronto, but admits the highspots of the job were the weeks he spent aboard ice reconnaissance planes in the North doing ice observation work and the trips he made in military aircraft to the North Pole and over the Greenland ice cap.

Henry claims he made another giant leap forward when he obtained the carbon dioxide job in 1982. "That's when I first became aware of climate change and saw the atmosphere as a single entity, from a planetary perspective".

It wasn't long before Henry saw that there were other "greenhouse gases" contributing to climate change . . . methane and chlorofluorocarbons for example. The latter gases play a major role in depleting the ozone layer, which is essential to human health and well-being. It was obvious



Henry Hengeveld

that all the elements of climate change were interlinked. Henry spent a fascinating six years piecing together all the data on climate change and interpreting them in popular form for a wide audience.

His involvement with the Conference on the Changing Atmosphere was just one more step in raising Henry Hengeveld's planetary consciousness level. Despite all the hustle and bustle of inviting delegates and organizing workshops, he has had time to hone his philosophy and beliefs on some important life or death issues.

He thinks a lot about the responsibility people have to maintain stewardship for this earth, possibly the only body able to support life in the universe. "We do not own this planet. It has been entrusted to us. We have an awesome task to make sure it remains in good shape for those who come after us".

On climate change in general, Henry thinks it's the most serious world issue after nuclear war. "It's not just the CFCs, CO₂, the acid rain, or the arctic haze . . . It's the combined total effect of all these man-made threats at once. In unison their impact could be enormous. In climate change issues, the sum is certainly greater than its parts."

Now that the hubbub of the Conference is drawing to a close, Henry looks forward to returning to his CO₂ Related Matters job. For one thing it is more scientific and more focussed. "Mind you," he adds, "I wouldn't have missed the Conference for worlds. It expanded my outlook immeasurably. I now tend to look at every issue in an integrated, holistic way".

Henry admits he has come a long way since he spotted his first rain cloud up in the sky over the farm. But he maintains that science is not the whole answer to our problems. "The existence of life on earth can not be explained by scientific principle alone. That's all the more reason for protecting it here on earth."

Despite, or perhaps because of his philosophical/theological views, Henry Hengeveld manages to remain every inch the complete atmospheric scientist.

Canada's oldest climate station on the move

Canada's longest continuous climatological station was moved once more during April 1987. The station, located at the University of Toronto, was moved 150 metres to the Trinity College campus because construction on the University of Toronto Law Library was infringing on the exposure at the old site.

The Toronto climatological station, which has provided official observations since January 1840, has been moved four times: in 1908 the station was moved from the Magnetic Observatory on King College campus to 315 Bloor Street; the station remained there until 1972 when it was moved to the Sandford Fleming building, close to the original site. After a fire destroyed the Sandford Fleming building in 1978, the station was moved to the U of T Law Library at the corner of Hoskin Avenue and Queen's Park Crescent. The station has now been moved 150 metres west to the Trinity College campus. Each move though, has never taken the station more than one kilometre from its original site.

1990 will be the 150th anniversary of the Toronto station. Plans are underway to have a historical plaque erected at the site.

Stay Cool!

Dress cool in summer heat. Lightweight, light-coloured and loose-fitting clothing reflects heat and sunlight and helps your body's regulatory system maintain normal body temperature. Cottons and linen are especially comfortable heatwave garb because they breathe and absorb moisture and body heat.

Eat less but drink more. Active adults should drink at least six to eight glasses of water a day during hot weather. Sweets and fatty foods will warm you up. Crunch on vegetables and fruits. They keep you cooler and replace the salts and water you lose.

When outside, take time to sit in the shade to relax and lower your body temperature. Showers are not always possible but you can cool off by running cold water on the wrists, behind the knees and holding a wet paper towel on the neck or forehead.

If your home isn't air conditioned, drop into a cool store, restaurant, or theatre every so often. Close the blinds and sit in front of a fan blowing over a bowl of ice cubes.

And don't forget house pets — all animals need lots of water in summer.

In summer, don't have the gas tank filled to the brim, particularly under a hot sun. Heat expansion often causes gas to overflow a newly filled tank.

CHINA TRIP — part two by Jim McCulloch

Crowds were enormous but people were polite

Our first ride on CAAC, the people's airline, was also quite an experience. We had been warned that the authorities insisted on only one appropriately sized piece of . . . carry-on luggage. So much for our source of information. There was luggage in the aisles and underfoot, as well as "in the overhead storage bins or under the seat in front of you". There was no harangue about seat belts (at least I don't think so; there were announcements in a variety of English that I really didn't understand, but none of the words resembled "seatbelt"). Because of weather at Hangzhou, we sat on the plane for quite a while before departing; even the cabin staff got off to stretch their legs on the tarmac.



Home of the Last Emperor and of several before him, the Forbidden City in Beijing displays an ornate symbol of longevity.

It was still raining with fog when we arrived at Hangzhou, and it was well after dark. By the time we had finished an unfashionably late dinner, I was ready for bed. Some of the others went for a stroll through the neighbourhood which was near West Lake, one of the more famous features of the city. The next day, we were taken on a boat ride around the lake, which was in a mild flood stage because of the rain that had fallen over the previous two days (a typhoon had passed by offshore to the east and had caused considerable rainfall over coastal regions). Part of the trip was to be a walk-about on one of the islands in the lake, but every dry square centimetre was already occupied. We saw a wide variety of boats on the lake, some powered by very small motors, some by human power. Our "skipper" was a beautiful young lady who didn't look older than sixteen, but sure knew how to manoeuvre the vessel.

We were dropped off across the lake from our embarkation point for a walk through a botanical garden, then taken by minibus (or maxivan) to a pagoda with many levels that dated back into the last millennium. Unfortunately, it was being renovated so we could not go in. Another of our

visits was to a nursery garden with many "bonsai"-type trees. These caught our interest, as did the souvenir shop with the artists' display attached. It was here that I acquired my oriental cousin. I was trying to find out enough information about the work to decide whether or not it qualified as "fine art", and was thus duty free. Clearly, I wasn't communicating (or vice-versa), so I told the artist that I would bring back my cousin to help. He was a little taken aback when I returned with AI (who bears no family resemblance), especially when AI started to bargain the price once my questions were answered. The lesson in haggling I got there served me well once I went shopping on my own in Hong Kong on the way back home. The four wall hangings, representing the seasons, are now in the family room of our home; needless to say, framing done here after my return was some ten times the cost of the art itself.

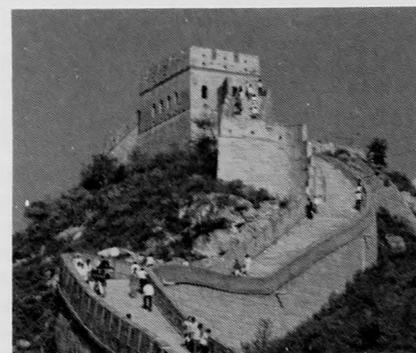
The train ride to Shanghai was after dark, so there wasn't much to see. On the platform at arrival, we got a taste of what the city was like. We had to go in one direction to meet the SMA people and pick up our checked luggage, and what seemed like the combined population of the ten largest cities in North America were heading toward the main exit in the opposite direction. Have you ever been claustrophobic on a train platform? It was awesome, in the literal sense of the word. We found out why the next day; in 230 square kilometers there live over six million people, and in greater Shanghai there are over 12 million. By contrast, Metropolitan Toronto covers about 400 square kilometers and has a population of less than 3 million.

One of the highlights of Shanghai from the tourist point of view was the Bund, the centre of the city, at the part of the harbour where the large cruise ships dock. The legacy of the west, from the time that Shanghai was the financial capital of the orient, was everywhere, particularly in the old buildings that once housed western banks, embassies and the like. There were crowds there too, most of them oriental (it makes one wince about full employment there). One interesting encounter was with a Chinese person, initially attracted by Howard's height (he was a head taller than most of the crowd) who then noticed the maple-leaf lapel buttons that we were sporting. He said, partly to us and partly to his companions, "Chanada, zed!" (the "c" is usually pronounced "ch"). We didn't understand until he showed us from his English-Chinese phrase book the people from the USA pronounce the last letter of the alphabet "zee", while Canadians pronounce it "zed". He then had a brief conversation in French with Jean-Guy Côté.

The other highlight was a visit to a Buddhist Temple. We were dropped from our minibus, and

walked through an area of souvenir shops. Then, at the entrance to the temple grounds, we were faced with a wide sidewalk that was bounded on one side by a rushing mountain stream and a sheer rock wall in which were carved many Buddhas (some sitting, some standing, some glowering accusingly, others smiling) and on the other side by another sheer rock wall. At the top of the climb was the temple and its ancillary buildings. One hears that the government of the PRC is anti-religion, but we saw no evidence of that. People were freely worshipping according to the traditions which were described in brochures that were available to us.

Beijing was a sharp contrast to anything that we had seen before. It seemed far less crowded, with wider avenues and less vehicular traffic. While our work occupied much of the time we were in the city, we did squeeze out a two-hour escape from SMA headquarters to visit the Forbidden City. We also saw a little of the summer palace because the banquet in our honour was held there. On Saturday morning, after a scientific lecture by each side, we were taken to the Ming Tombs and the Great Wall; that was a very memorable day, given that I was selected to give the Canadian lecture on the train into China, and the visit to two of the most famous archaeological sites in the world. The story around the finding of the tombs and the restoration of the one for the Emperor Ding Ling (I think I would have changed my name; Ding Ling Ming?) is fascinating. Moreover, the sculptures of real and imaginary animals and warriors that line the



The steep climb up the Great Wall of China.

approaches to the tomb area must rival the Xian terra-cotta army for visual impact (we were not able to include Xian in our itinerary, except for Barry Goodison who had to give a series of lectures at institutes of the Academia Sinica after we left).

Sunday morning we had the ceremony which included the signing of that final report, then flew in the afternoon to Guilin. For any of you who saw the Peter Ustinov documentary on China (it was



Entrance to precious Ming tombs, pays tribute to Emperor Dingling. Left to right, facing camera Al Lo, Howard Ferguson, Barry Goodison, Jean-Guy Cote.

broadcast in North America while we were in China), you will recognize how difficult it is to describe the particular land forms along the River Li near Guilin; these make the area very famous. Our visit to that city included a boat trip down the river, past the spectacular scenery. The trip lasted for several hours, and included dinner cooked in large woks at the back of the boat. We could watch the meals being prepared on other excursion boats because a large fleet made the trip. The river is shallow and the channel narrow; watching the various pilots jockey for position was always interesting if the scenery became momentarily less spectacular. Also of interest was the variety of smaller junks, sampans and other boats, some of them home for a family, that we passed on the journey. At the other end, we were picked up by our minibus, and faced another harrowing (I could say hair-raising, but those of you who know me would laugh) ride back into the city.

Looking back on the trip, I have many impressions that will stick with me for the rest of my life. I recognize that I saw only a small portion of a large country, so one can't generalize too far. Large cities, separated by extensive agricultural areas dotted with small villages. Crowded cities. Crowded streets with traffic conditions that would turn my hair even more grey. Only the vehicles seemed to be in a hurry; the pedestrians and the ubiquitous bicycles moved along at a calm, almost sedate, speed. Super cuisine of an amazing variety of styles. Spectacular scenery. Historical artifacts

that predate North American history by millennia. A polite, yet curious people that respect you, and expect the same in return. People that have a sense of their own culture and history.

There are some striking differences in expectations. The staff of the SMA are as loyal and as proud of their profession as the staff of AES. The organization there is much larger (over 67,000 staff compared with our 2,400) and many of them live on the grounds in small apartments provided by the organization. The hours are long, but there is a long lunch break which allows for a brief siesta. Because most people buy the groceries for the next meal only, perhaps on their way home from work at noon or in the evening, a refrigerator is not an appliance to yearn for (a television is a much more desirable goal). The situation in Hong Kong, at least the part I saw, is much closer to that here in Canada than in the PRC. That perhaps explains the undercurrent in the colony about 1997, when title reverts to the PRC.

I shall not likely get back to China. Nevertheless, I do have many memories that I shall always cherish.

Mr. McCulloch is director general of the Canadian Climate Centre.



Striking example of a Chinese pagoda, nearly 1000 years old.

Lively happenings

cont'd. from page 5

impersonal letter giving a phonetic transcription of the name, trainee Lazarus Ageeakok — an Inuk and a native of Baffin Island — prepared a list of northern communities having Inuktitut names, and recorded them on cassette with their meaning and spelling. The cassette was sent to Japan along with a package of information on Environment Canada and Baffin Island, and a covering letter from the Regional Director.

June 7, 1983 A violent thunderstorm near Québec City produced pea-size hail and winds gusting to 100 km/h. The winds damaged light aircraft parked on the ground at Ste-Foy Airport and snapped large trees and power lines at St-Nicolas.

June 3, 1961 At Regina there began an incredible 10-day heat wave when the afternoon temperatures were above 32°. Across Western Canada June 1961 is remembered as the hottest, driest, sunniest month in history. By the end of June, the grain growing areas were locked into a serious drought that threatened the economy.

June 16, 1986 Severe hail and thunderstorms rolled across southern and eastern Ontario. In Haliburton cottage country, a tornado ripped through, causing \$4 million damage to more than 100 cottages and homes, and downing thousands of trees (some 100 year pines), and many hydro poles.

ZEPHYR BREEZES

For Daniel Pokorn, Secretary of State Department translator at AES Downsview for the past six years, it has been a busy year. In addition to crafting words to help AES employees express their thoughts in Canada's other official language, Daniel has achieved prominence on the Canadian and international sculpture scenes. In the spring of 1988 he had half a dozen of his very contemporary works displayed at an exhibition for francophone artists at York University, Toronto and at the same time he was the featured artist among a group of Canadians exhibiting "in steel and stone" in Chicago at an exhibition opened by Canada's consul general in the "Windy City".

Last year Daniel was elected president of the Sculptors' Society of Canada and, quite naturally, he will be exhibiting at a special show to commemorate the society's 60th anniversary in Toronto this fall.

Daniel, who has been exhibiting in Canada for some 16 years, works from a basement studio in north-west Toronto on evenings and weekends. His favorite material is stone — everything from alabaster to "pudding stone" (although he uses semi-precious metals to achieve contrast.) The subject matter of his sculptures varies from landscapes to humor. Right now, he is specializing in faces. His wrinkled stone bust of the "Wise Man" became a sort of "trademark" for the Chicago exhibition and appeared in several U.S. publications. A different kind of face illustrates another well-known Pokorn sculpture titled "And love will prevail". The torso resembles a skewed computer keyboard symbolizing the impersonal world of high-tech. But there are signs of romance everywhere — arms like flapping wings, a pathetic "Snoopy" face, even the words, "Love, Amour" highlighted on the keyboard.

Daniel has already had works exhibited as far away as Hungary. Now he hopes to be able to hold a show in his native France. A new museum of contemporary art is opening near St. Etienne. He has sent in an application to exhibit there and is keeping his fingers crossed.

NOTE:

Interviews on AES Pacific Region staff's reaction to the Strategic Plan, plus articles on the Marine Weather Program and the new BC Lower Mainland Weather Office will appear in the next issue.

It had to happen! A recent meeting of the Val d'Or (Quebec) town council decided the road leading up to the local weather office (and the airport) should be named Rue de la Météo. AES staff at the WO4 are said to be flattered by the council's edict. Just possibly it's the first Weather Street in Canada.



And love will prevail

One of the liveliest AES weather publications has come out of the Atlantic Region. A year or so ago Lionel Haughn, Weather Services coordinator for the Region, teamed up with John Gray of DOE regional communications, to produce a book of weather terminology for the lay person. Haughn knew the public was aware of many meteorological terms without knowing their precise meaning. The problem was to present them in ways both simple and amusing. Eventually, the pair hit on the idea of using humorous cartoons to assist with the definitions. A male and a female character were invented. Generally, but not necessarily, the man bears the brunt of weather conditions. For instance, on the cover a man and a woman are seen sunbathing side by side. While the woman basks contentedly in the sun, the man has unfortunately attracted a private mini rain storm to his beach mat! The man also skids perilously on ice while observing the aurora borealis or is struck by lightning while turning on a radio. The woman, though less threatened, nevertheless illustrates turbulence by playing the role of a clumsy air hostess and demonstrates hail by poking her finger through her damaged umbrella.

Haughn says not all the graphics are humorous. Some illustrate weather phenomena in serious, if simplified form. The colorful booklet called "In Terms of Weather" was conceived primarily for the complex storms and weather of Atlantic Region, but could one day go national. Even now such terms as Chinook and Tornado, hardly applicable to the Maritimes, are included, because the public knows about them.

So far, some 5-6,000 copies of the booklet have been distributed and the overall response has been "excellent."



During the Canadian Science Writers Association convention in Vancouver, B.C. April 30 — May 3 a small group of science writers were given a complete tour of the Pacific Weather Centre.

Left to right: Steve Sullivan, Leonard Bertin, Eleanor Bertin, Mary Maskin, tour guide John Spagnol and Gordon Black.

In Terms of Weather...

An Environment Canada Guide to Weather Terminology



Environment Canada Environment Canada

Riding a Pacific storm

by Dennis Engemoen

I was skeptical when the bus left AES headquarters in the pouring rain for the second AES ski trip to Mont Tremblant March 25. But I decided to follow our fearless leader, (AAFA) Sandra McGuire.

The package included: transportation, two nights accommodation, four meals and a weekend lift ticket for only \$175.00.

Some had a good supply of "refreshments" for the bus ride. I caught up on my reading and chatted with neighbours. I was dreaming of Olympic Gold when we reached the "Chalet des Chutes" parking lot.

Saturday morning a blanket of fog covered the hill. We were literally in cloud 9 but clear afternoon skies gave us all a taste of what Tremblant spring skiing is all about.

The food itself made the trip worthwhile. What better place for "Pain Doré" with maple syrup for breakfast than in the Laurentians in March? And what about those candlelight dinners of exquisite prime rib or fresh lamb, reminiscing over the day's best runs with a bottle of French wine. In addition there were piano renditions of Claude Léveillé's "Frédéric" and Gilles Vignault's "Mon Pays . . .".

Sunday morning's rain convinced many to forfeit skiing for a good book by the fireplace. But what a bonus when the rain turned to snow as we rode the chairlift up the mountain. The keen ones managed to squeeze in two full days of skiing. Who could ask for anything more?

Among the trees and mounds of snow on Tremblant's summit, we came across an AES Chemical High Elevation Fog (CHEF) station. Continuous surface weather observations including ozone and precipitation pH measurements are recorded. PH's of 3.4 had been measured the previous week. This lab is one of several set up by Dr. R. Schemenauer to study the chemical composition of fogs in several areas of the world (Zephyr October, 1987)

There are rumors of a 1989 ski trip perhaps to Whistler, B.C..

By Lewis Poulin



Ski assembly at the top of Mont Tremblant.

Tuesday, 24 November — Depart Pat Bay on *CSS Parizeau*. Will use a Vaisala "DigiCorra" Radiosonde System for upper air soundings, and an HP-85 mini-computer with a Synergetics transmitter to transmit the coded data via the GOES satellite to Vancouver Pacific Weather Centre. Terry Duffy and I will eventually do these soundings every three hours. Begin soundings every 12 hours while ship travelling to Station PAPA (Site of the old AES weather ship).

Saturday, 28 November — Lots of spray coming over container and ship's motion making it a bit tricky to gain access. Container wet enough inside by now so it's becoming a real pneumonia hole, and must be plunging up and down 20 feet or more as well as rolling. Ship still travelling to Station PAPA.

Sunday, 29 November — Arrive at Station PAPA. Wind and seas have dropped. A good day.

Monday, 30 November — Going to three-hourly sondes as wind now 41 kts and centre of low approaching rapidly.

Wednesday, Thursday, 02-03 December — Launching frequent sondes. One low off, another large one approaching.

Friday, 04 December — Wind 110 degrees at 40 knots. Launching OK. Seas have built to the point where ship is beginning to sustain damage — steel tailgate was washed away.

Around 1130 hours Radiosonde smashed at release. No second attempt. Wind 55 knots becoming dangerous to access container.

By 1315 hours — winds had increased to 50 knots gusting to 70 kts.

Les Spearman, Chief Scientist, Institute of Ocean Sciences added some details for this date. Wind at 0815 hours was 30 knots gusting from 80 degrees.*

1400 hours — Inflatable boats broke free of lashings on helicopter pad. Both moved and re-secured through heroic efforts of Bosun, Randy Smith and John Green of ship's crew. AES satellite antenna broken off at base, AES antenna tower bent, lifeboat cover caved in. Wind 50-70 knots from 130-170 Dishwasher caught fire. Attended by electrician.

1500 hours — Seven cm of water on deck on aft lab when rear deck took a green one. Wind 55-75 knots.

1620 hours — Wind diminishing. Small patches of blue sky.

1645 hours — Storm passing us and moving east. Hurricane force wind warning issued for B.C. coast.

1735 hours — Winds down to 20-30 knots. Large patches of blue.

1800 hours — Balloon launch report: Launching hatch not operable, extension cord inside shed shorted and fried, uninterruptible power supply scorched. Power to shed shut off.

1830 hours — Ship heads for Ocean Storms experiment area.

Saturday, 05 December morning hours — Inspect container again. Electronic equipment OK with the exception of the floor-mounted power supply.

The reason for all the water inside the container and the damage to the hatch is that the seas have been coming over the fo'c'sle, hitting the roof of the container, pouring under the hatch cover and lifting it, then being deflected down through the hatch opening. The GOES uplink transmitter antenna was torn off the mount and the co-ax connector protruding from the base of the antenna was broken.

My plastic toolbox which was still firmly bungeed down to the floor of the container, with the lid snapped shut, has two cm of water in the top tray inside. Tools rusting merrily.

Afternoon: Bosun rigs lifeline over top of container, climbs on roof with safety belt, and repairs hatch. (Les Spearman drills holes for two new bolts).

Get power back for lights and space heater and resume three-hourly launches. Drifter buoy deployed.

Evening: Bernie Minkley uses his butane soldering iron and a broken connector from his toolbox to attempt temporary repair of GOES transmitter antenna.

Sunday, 06 December 0900 hours — Straighten out transmitter antenna mount, and put jury-rigged antenna up. Power readings OK. Back in operation.

Mr. Engemoen is a technical officer, AES Pacific Region.



Stormy Pacific waves as experienced by Dennis Engemoen aboard the CSS Parizeau.

STAFF CHANGES / CHANGEMENT DE PERSONNEL

Appointments/Promotions Nominations/Advancements

D. J. Russell (SM) Senior Policy Advisor/Conseiller princ. en politiques, APPA, Hull, Que./Qc
M. Hawkes (MT-6) Meteorologist/Météorologiste, APPA, Hull, Que./Qc
R. Turna (CR-4) Clerk/Commis, PAEP, Vancouver, B.C./C.-B.
L. Skelding (CR-4) Clerk/Commis, PAEW, Vancouver, B.C./C.-B.
J. Bowling (EG-6) Pres. Tech./Techn. en prés., W04/BM4, Prince George, B.C./C.-B.
R. Lakeman (EG-6) Pres. Tech./Techn. en prés., W04/BM4, Castlegar, B.C./C.-B.
J. M. Courturier (EG-6) Pres. Tech./Techn. en prés., W04/BM4, Prince George, B.C./C.-B.
A. McCarthy (EG-6) Pres. Tech./Techn. en prés., W04/BM4, Terrace, B.C./C.-B.
J. Richards (CS-2) Programmer/Programmeur, PAEI, Vancouver, B.C./C.-B.
H. E. Turner (SM) Special Advisor to APDG/Conseiller spécial de l'APDG, Downsview, Ont.
C. M. Butara (SCY-3) Secretary/Secrétaire, AWPD, Downsview, Ont.
R. B. Saunders (MT-7) DOT Liaison Met./Met. liaison MDT, AWPC, Downsview, Ont.
C. Reid (PE-3) Personnel Officer/Agent du personnel, AHRR, Downsview, Ont.
B. Colley (PE-3) Personnel Officer/Agent du personnel, AHRO, Downsview, Ont.
C. Simard Sulymko (PE-2) Personnel Officer/Agent du personnel, OAEP, Toronto, Ont.
K. McAuley (SCY-2) Secretary/Secrétaire, ACSL, Downsview, Ont.
E. Anderson (CR-2) Clerk/Commis, CAES, Winnipeg, Man.
D. Comeau (PE-3) Personnel Officer/Agent du personnel, QAEP, St-Laurent, Que./Qc
D. Gaudreau (CR-4) Clerk/Commis, QAEP, St-Laurent, Que./Qc
A. Langlais (EG-5) Met. Tech./Techn. en mét., Ice Centre/Centre des glaces, Ottawa, Ont.

L. Boucher (EL-4) Electronics Tech./Électronicien, QAEO, St-Laurent, Que./Qc
G. K. Redekopp (MT-5) Meteorologist/Météorologiste, CFB/BFC, Portage la Prairie, Man.
M. Faucher (MT-2) Met. Dev. Level/Niv. perf. mét., CFFC/CPFC, Trenton, Ont.
D. Lundquist (MT-2) Met. Dev. Level/Niv. perf. mét., CFFC/CPFC, Trenton, Ont.
I. Hamilton (MT-5) Shift Supervisor/Surveillant de quart, CFFC/CPFC, Trenton, Ont.
K. Johnson (MT-2) Met. Dev. Level/Niv. perf. mét., CFFC/CPFC, Edmonton, Alta./Alb.
J. Morneau (MT-2) Met. Dev. Level/Niv. perf. mét., CF METOC, Halifax, N.S./N.-É.
C. Doyle (MT-2) Met. Dev. Level/Niv. perf. mét., CF METOC, Halifax, N.S./N.-É.
I. J. Butler (EG-3) U/A Tech./Techn. en aér., WS2/SM2, Stephenville, Nfld./T.-N.

Temporary or Acting Positions/ Postes temporaires ou intérimaires

M. LeBlanc (SM) A/Chief, Program Devel. & Evaluation/Chef, int., Conception & évaluation des programmes, APEC, Downsview, Ont.
A. L. Fenech (AS-1) Admin. Officer/Agent d'administration, APEC, Downsview, Ont.
G. Thompson (EG-7) OIC/Responsable, W04/BM4, Castlegar, B.C./C.-B.
M. Law (EG-4) OIC/Responsable, WS3/SM3, Lytton, B.C./C.-B.
G. Lunn (EG-7) OIC/Responsable, W04/BM4, Fort Nelson, B.C./C.-B.
D. Linton (EG-5) OIC/Responsable, WS3/SM3, Cape St. James, B.C./C.-B.
M. Loiseau MOP Assignment/Affectation P.I.G., APEC, Downsview, Ont.
E. Vaserbakh (CS-1) Programmer/Programmeur, APEC, Downsview, Ont.
S. R. Blackwell (MT-7) Head, Prof. Training/Chef form. professionnelle, ACPT/T, Downsview, Ont.
L. Funnell (EG-7) MOP, AWPD, Downsview, Ont.
K. Perry (AS-1) Admin. Officer/Agent d'administration, A/PAEAA, Vancouver, B.C./C.-B.
K. Bishop (AS-1) Admin. Officer/Agent d'administration, ACSF, Downsview, Ont.
M. Aliridha (CR-4) Clerk/Commis, ACSF, Downsview, Ont.
S. Burns (SCY-2) Secretary/Secrétaire, ACSO, Downsview, Ont.
M. Pratte (EG-6) Pres. Tech./Techn. en prés., QAEWR, Mirabel, Que./Qc
J. M. Sankey (CS-1) Programmer/Programmeur, CFFC/CPFC, Trenton, Ont.
P. Courbin (MT-4) Meteorologist/Météorologiste, MOBCOM, St-Hubert, Que./Qc
K. Morris (MT-8) Chief, Tech. Training/Chef form. technique, ACTT, Downsview, Ont.
G. Babin (AS-7) Sup. Met. Training centre/Surv. centre de form. mét., TCTI/IFTC, Cornwall, Ont.

Transfers/Mutations

C. B. Adamson (SM) Chief, Forecast Operations/Chef opér. de prévision, OWC/CMO Pearson Int'l. Airport/Aéroport international Pearson, Ont.
T. Shalanski (MT-2) Met. Dev. Level/Niv. perf. mét., PWC, Vancouver, B.C./C.-B.
M. Madryga (MT-2) Met. Dev. Level/Niv. perf. mét., PWC, Vancouver, B.C./C.-B.
J. Dion (MT-2) Met. Dev. Level/Niv. perf. mét., PWC, Vancouver, B.C./C.-B.
E. Oja (MT-5) Meteorologist/Météorologiste, AWDH, Downsview, Ont.
R. Gagnon (MT-7) Policy Program Coordinator/Coordinateur progr. politique, ACDG/P, Downsview, Ont.
R. Elliott (EG-4) U/A Tech./Techn. en aér., WS1/SM1, Shelburne, N.S./N.-É.
C. Tonna (CR-4) Clerk/Commis, ACSF, Downsview, Ont.
M. Teeter (SCY-2) Secretary/Secrétaire, ACSI, Downsview, Ont.
K. Ford (AS-1) Admin. Officer/Agent d'administration, ARQD, Downsview, Ont.
R. Tortorelli (EG-6) Met. Tech./Techn. en mét., Vancouver, B.C./C.-B.
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G. Zak (CS-2) Programmer/Programmeur, CFFC/CPFC, Edmonton, Alta./Alb.
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M. Webber (MT-2) Met. Dev. Level/Niv. perf. mét., WO4/BM4, Gander, Nfld./T.-N.
J. D. Allard (EG-3) Met. Tech./Techn. en mét., WO4/BM4, Gander, Nfld./T.-N.

Departures/Départs

D. Veale, AES, Vancouver, B.C./C.-B.
B. Wolanski, PAED, to/au, Dept. of Communications/Min. des Communications, Vancouver, B.C./C.-B.
J. Yeung, PAED, to/au, Childrens Hospital, Vancouver, B.C./C.-B.
L. Peat, Winnipeg, Man.
R. Betournay, Winnipeg, Man.
J. Marsh, Winnipeg, Man.
L. Tanner, U/A Tech./Techn. en aér., Shelburne, N.S./N.-É., to/à, Agriculture Canada
M. Gervais, QAEM, St-Laurent, Que./Qc to/à, Immigration Appeal Board/Commission des droits d'appel à l'Immigration
L. Paquin, QAEOU, Maniwaki, Que./Qc to/à, Noranda Mines

Leave of Absence/ Congés autorisés

K. Currie, AWFH, Downsview, Ont.

Retirements/Retraites

E. Chirka, AWPD, Downsview, Ont. March/mars 1988
M. McMahon, CAEW, Winnipeg, Man. March/mars 1988
T. Gordon ACTD/A, Downsview, Ont. April/avr. 1988
W. H. Gowdy, AAF, Downsview, Ont. May/mai, 1988