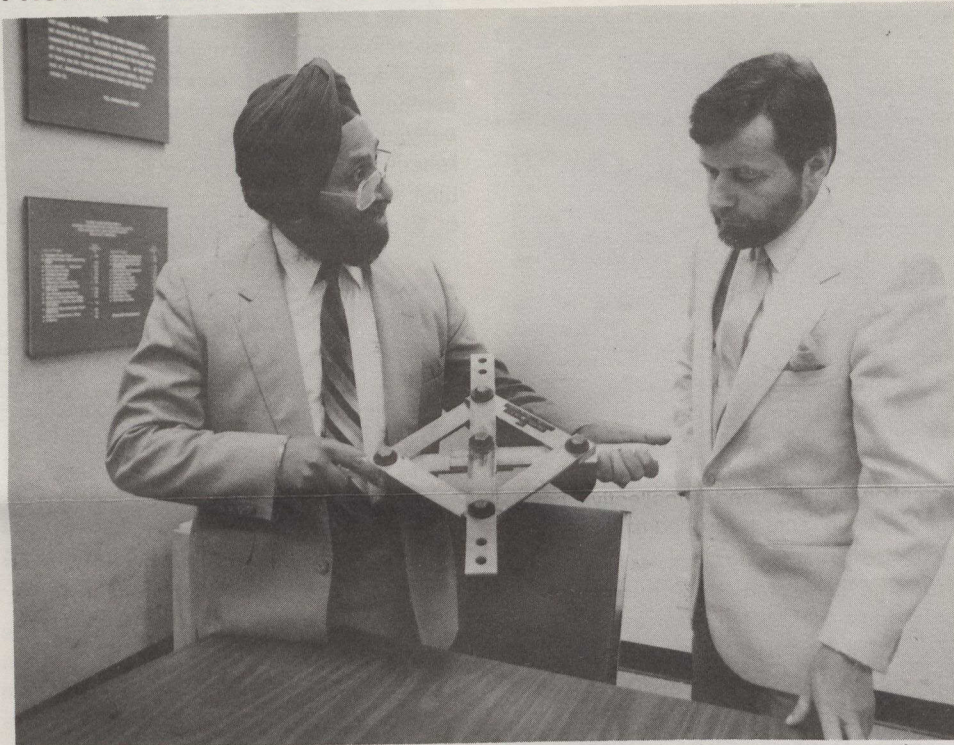


Friction brakes to avert earthquake damage



Dr. Avtar S. Pall (left) demonstrates a half scale model of one of his earthquake resistant devices to Jean-Louis Dontigny, the chief structural engineer of the SNC Group. The simplicity and economy of the devices are among their great advantages.

An earthquake resistance device invented by Canadian engineer, Dr. Avtar S. Pall, was a highlight of the eighth World Conference on Earthquake Engineering held in San Francisco in July. The invention applies the principle of the friction brake to building construction.

Dr. Pall, of the Montreal-based SNC Group, Canada's leading engineer-architect, said he believes his invention could revolutionize structural engineering and construction practices in earthquake-prone regions.

A number of friction devices suitable for different types of building have been developed and patented by Dr. Pall. They not only offer a simple, low-cost way of controlling earthquake effects in new buildings but they can also be added easily to existing frame structures.

Basically, the devices consist of heavy duty brake lining pads, trapped between two sliding steel surfaces, which can be incorporated at strategic points in building joints. They then act as safety valves to limit forces exerted on the structure or they serve as dampers to limit the extent of vibrations.

According to Dr. Pall, "when a major earthquake occurs a large amount of kinetic energy is fed into a structure. The building sways back and forth in proportion to the energy fed in. At a

certain point, materials bend, twist or crack," often resulting in excessive damage. He suggests that while the standards set by current building codes should avert collapse in severe seismic shocks, they accept bending, twisting and cracking as unavoidable.

"With my devices, all that could change. Much of the vibrational energy would be dissipated mechanically. Just before the materials reach the limit of elasticity, the devices slip. As in a moving car, the motion is slowed by braking," maintains Dr. Pall.

Tests to date have shown that device-equipped buildings perform better compared with the computed responses of conventional buildings. Independent studies carried out by the Earthquake Engineering Research Center of the University of California at Berkeley have confirmed Dr. Pall's original findings. Large scale model buildings equipped with the devices on a shaking table are currently being tested in separate studies of the University of British Columbia and at Concordia University in Montreal.

Dr. Pall has already been acclaimed for his original research on the devices which he initiated in his home. In 1982 he received the American Society of Civil Engineers' Raymond C. Reese Research Prize for outstanding contributions to structural engineering.

Vote by phone

Canadians can now dial "900" numbers to register votes or listen to public announcements, now that Telecom Canada member companies have received regulatory approval of the new 900 service. Telecom Canada will offer the service for two years on a trial basis.

The Canadian Radio-Television and Telecommunications Commission (CRTC) has approved the first phase of the trial for Bell Canada and the British Columbia Telephone Company. Other Telecom Canada members will receive their approvals through provincial regulatory authorities, as required.

In the trial's first phase, which began July 1, Canadians will have access to vote-ins and recorded or live announcements provided in the United States through the AT&T DIAL-IT 900 Service. In the second phase, to begin October 1, the service will be available to Canadian producers, and callers will be able to access "made-in-Canada" applications.

Dial-a-shuttle

"With 900 Service, we'll be able to join Marc Garneau, Canada's first astronaut, in the space shuttle this fall," said John Farrell, president, Telecom Canada. "We'll be able to listen to the astronauts talking to mission control."

The number to call for "dial-a-shuttle" is 1-900-410-NASA (112-900 for all 900 numbers in British Columbia), sponsored by the National Space Institute in the US. It will be available for the next shuttle flight as well as for Garneau's flight in October.

Said Farrell: "The shuttle hotline is only one example of a 900 service application that Canadians have tried to access in the past, but couldn't."

Applications of 900 service are advertised by sponsors, advising customers of numbers and times to call. The variations range from vote-ins on political issues to 24-hour sports or stock market "hot-lines".

Sponsors benefit from 900 service in many ways. They can use it to promote products, reinforce a corporate image, create a media event, send a message to a target audience and track responses, or provide a public service.

For instance, rock Star Michael Jackson can be heard promoting his latest tour on a 900 service information line: 1-900-410-8687.

Updates on current 900 numbers in the US are provided on a 900 service information line. A caller to 1-900-410-1212