IEEE REGION 10 NEWSLETTERS OF 1997

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Message from the Director IEEE Region 10

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IEEE Asia Pacific Region
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Introduction

After a lot of preparations and effort, the first edition of *The Asia Pacific Channel*, the IEEE Region 10's Forum publication, will reach every IEEE member in the Asia Pacific Region. It gives me great pleasure to report to you the developments of the IEEE in our Asia Pacific Region. The year 1995 has been an exciting and busy year for the IEEE Region 10. As one of the most diverse and fastest growing Regions of IEEE, there has been many changes, development and growth.

Growth and Technical Vitality

We have witness a phenomenal growth of membership, both in quantity and quality in 1995. The year-end figure shows that the Region has achieved its goal of at least 10% growth. The growth in numbers has also been supported by expansion in technical activities. Over the year there have been a total of 12 society chapters or joint chapters formed in Bangladesh, Beijing, Daejon, Hong Kong, Hyperabad, South Australia, Taipei, Tokyo, Uttar Pradesh and Western Australia. These represent a very well spread increase in technical activities within the Region. The Region is doing everything possible to encourage and sustain this trend in membership growth and technical activities.

Transnational Networking & National Societies Links

The most significant event in Transnational Networking in the Region has been the TAB (Technical Activities Board) Colloquia visit to Australia and New Zealand. Led by Pete Morley and Executive Director Ted Hissey, two groups consisting of members of the Executive Committee, representatives from a number of technical societies and myself as Region 10 Director, visited all Sections in Australia and New Zealand. The visits included technical seminars, round-table conferences with Section leaders, and visits to local industries and universities. In addition President Cain visited New Delhi in April '95 to sign an agreement with the IETE of India.

Over the past year I have also visited a number of Sections in my capacity as the Director. These included the Taipei Section, the Beijing Section where I addressed a two-day event celebrating their 10th anniversary, the Singapore Section to open the Mega Conference, the Tokyo Section to address the Robotics & Automation Society AdCom in

Nagoya, Japan, the Thailand Section in Phuket during the Regional Meeting, and the Queensland and Western Australian Sections during the TAB Colloquia.

A historical event happened towards the end of the year when President Cain, Past-President Nagle, Professor Felix Wu (representing the Power Society) and I visited both Hanoi and Ho-Chi-Minh City in Vietnam. In addition to meeting the leaders of the major National Society, Radio Engineers of Vietnam (REV), we were also received by the Minister for Science and Technology. Good will supporting the development of IEEE in Vietnam was entirely expressed and there is a plan to sign a joint agreement around May 1996 during their major National Conference.

Regional Structure Re-Organization

With the rapid changes in Region 10, the current regional structure and representation was considered outdated and in need of a major review. A 'brainstorming' session was led by Director Raymond Findlay during the Region 10 Committee Meeting in April '95, Phuket. The objective was to identify an alternative organization model which is a more efficient and equitable structure providing better representation of our members' needs. The model should lead the Sections into the next Century. The schedule is to have two or three alternative models ready for consideration in the Regional Committee Meeting in 1996. The process is currently in active progress.

There has been much change in the Region caused by economic and tech-nological developments. Many initiatives and projects have been started in 1995 which are yet to be completed. I look forward to continuing these efforts with the required momentum in 1996 and the help of a very dedicated and competent Executive Committee.

Historical Visit to Vietnam - Meeting with the Minister of Science & Technology

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Technology and Ethics

Anthony E. Gascoigne
Conference Coordinator
IEEE Asia Pacific Region

Extract from "An Automation Policy for Australia" by the Australian Robot Association Inc.

Automation and Human Need

Automation has the potential for radically improving the quality of life, as can be demonstrated from both an historical perspective and numerous present-day examples. The progressive elimination of many of the boring, repetitive, unsafe and demeaning work practices on the farm and in the factory fall into the first category; modern developments in surgery, road building, health care and fruit-harvesting in the second.

It is frequently contended that automation causes unemployment, but this is a very myopic view. It is also an age-old argument which by now should have lost all credibility. Long before the space age, *every* advance in technology was likely to attract objections of this sort; no doubt the man who invented the wheel was accused of destroying jobs!

While we do not wish to denigrate persons who sincerely hold such beliefs, we suspect that they (more often than not) have simply found a convenient scapegoat. In the words of Professor Helen Hughes, "It is not surprising that Ned Ludd and the original Luddites did not understand the beneficial effects of mechanisation. But some 200 years later there is little excuse for using essentially the same arguments to claim that advances in technology are the principal causes of unemployment".

With respect to an economy as a whole, precisely the reverse relationship is seen to hold: nations which make the greatest use of automation technologies tend to have *low* levels of unemployment. For example, Japan with some 350,000 industrial robots has an unemployment rate of less that 3%. Whatever interpretation is placed on these figures, they can hardly be dismissed as statistical abnormalities. Nor can they give any comfort to those who see a direct and inevitable nexus between automation and unemployment.

Of course, major changes in industry, including technological changes, have at times been associated with significant dislocations of parts of the work force. But this is related as much to the *methods used* for implementing change as to its technological basis. That such changes have had an adverse social impact does not eliminate the need for change per se. For example, very few people acquainted with, say, a 1930'sstyle production line, or a garment manufacturing "sweat shop", would be attracted to such a way of earning a living. Any informed observer would conclude that "there must be a better way" - on both humane and technological grounds. (Yet manufacturing operations in both of these categories still exist today.) Apprehensions about the undesirable consequences of automation do nothing to address the known human needs in such situations.

In our view, it is much more reasonable to identify particular *opportunities* proved by technology, and to plan pro-actively to overcome all attendant disadvantages. Far from neglecting social issues, such an approach provides the dynamic for orderly (and equitable) change in all levels of society.

Ethical Considerations

Despite our confident statements in the preceding section, we recognize that there will be some people with genuine ethical concerns - either relating to technology in general or to Automation technologies in particular. It is not practicable to deal here with ethical and philosophical issues in any comprehensive fashion. Accordingly, the following outline is restricted to only a few pertinent issues. For our present purposes, it is useful to distinguish between the two connotations: Ethics as a set of moral principles, on the one hand; and Professional Ethics, being the expected codes or norms of behavior of a particular profession or group, on the other.

Some ethical principles

There is no unanimity as to what ethical principles ought to apply in the present context. However, we expect that the following five propositions will have broad acceptance. Firstly, we might expect that technology will convey more advantages than disadvantages. Certainly, outright harm is to be avoided. "No robot shall harm a human being, or, through inaction allow a human to come to harm", states Asimov's First Law of Robotics. Secondly, the particular manner in which the advantages are manifested is important; that is, we should have a *social conscience*. As far as practicable, the benefits should be widely spread throughout the community. At the very least, we should avoid situations where the benefits available to one group or segment of society are at the expense of another group, and outright exploitation is to be deprecated.

Thirdly, we should expect that technology will involve a wise use of resources. This must necessarily include *economic* resources, since a wastage or reckless use of money cannot benefit anyone. But it must also extend to *natural* resources. We should not extract or consume resources simply because they are *there*, or because it is technologically possible to do so; nor should we willfully despoil our environment. In all these respects we must have proper regard for the future consequences of our actions.

Fourthly, we will doubtless require that technology will not detract to any significant extent from individual freedom. Before adopting a new technology we must be amply satisfied on this point. A mindless commitment to a *machine culture* is an affront to humanity and an unnecessary evil: we have no right to turn humans into automatons.

Fifthly, we might expect that technology will not detract markedly from the *quality of life* enjoyed by a particular community or group of citizens. This necessarily extends to the difficult (but valid) concepts of Aesthetics, along with other more quantifiable measures of community impact (air and water pollution; noise levels; traffic density; etc.).

Unfortunately, the real-life application of general *principia* along the foregoing lines is never easy and can be very nebulous. A single example will server to emphasize this point. The potential for harm of a given technological application is often extremely difficult to establish. Rather than a simple good/bad classification, we are typically confronted with various levels of *risk*, and it remains to determine whether the risk(s) are acceptable or not. Sometimes a considerable time must elapse before the ultimate consequences of use are known. Also, the consequences of *rejection* must be considered; for existing technologies and practices always carry some risk, as well as proposed innovations.

Even if the objective risks are well known (by no means a common situation) we are left ultimately with the subjective *perceptions of risk* by the parties involved. For it is a truism that if a person perceives that a risk is "too high", then for that person it is an *unacceptable* risk.

Professional ethics

Professional groups commonly have a code of ethics to which members are required to subscribe as a condition of membership. As an example, members of the Institute of Electrical and Electronics Engineers Inc bind themselves:

... to accept responsibility in making engineering decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;

Other sections of these codes deal with matters such as a specialist knowledge and area of competence, personal probity, and refraining from malicious criticism of other engineers. (We make particular reference here to professional engineers because this group usually has a key role in respect of new technological applications). We do not wish to appear unduly critical of these excellent Codes; in fact, the conservative view (which we fully support) is that the engineering profession would be greatly diminished in stature in the absence of noble statements of this type. However, there are a number of *difficulties* which are pertinent in the present context, and which have been very much in evidence during recent controversies. We briefly draw attention to two such issues.

Firstly, there is the obvious problem of determining the *public good*. Which of the general criteria outlined above is to prevail? Alternatively, in what order of precedence are they to be ranked? And who is ultimately to decide? The matter of Public Safety is of special concern since it depends so much on the perceptions of those involved, as emphasized earlier. The perceptions of the general public are in turn affected by the stated views of politicians, industrialists, public officials, technical experts, lobby groups, media commentators, and all other parties in the public arena at the particular time.

Some lobby groups (and the experts they engage) seem to delight in making alarmist statements which elicit a "fear" response in the public mind. This may not always be intentional, but it is an inevitable consequence of unqualified statements and immoderate language in referring to complex technical issues. In terms of formal Codes of Ethics, it is difficult to see how the *public good* is ever well-served by widespread *public fear*: for this is the worst possible climate for rational decision-making.

Secondly, we refer to the problems of *Expertise* per se. It is well known that experts are sometimes wrong. A person may be eminently qualified and widely experienced (and so comply with all the customary requirements of professional Ethics) and still hold erroneous views. Also, an expert is probably no more immune to partisan influences or other forms of bias than is an unqualified individual.

Similarly, a professional is enjoined by Ethics not to unfairly denigrate a fellow-professional, but in practice this may be very difficult to avoid. If a debate on a complex technical issue has reached the public arena, then a certain amount of *name-calling* between adversaries is almost inevitable. Certainly, it is not a time when objective arguments and an informal exchange of technical opinions can readily take place. The spectacle is particularly demeaning if subsequent events show that the experts on both side of the argument were substantially in error!

Such difficulties have caused a certain degree of reaction against Expertise of all forms. To some, the very notion of "an expert" connotes undeserved status and privilege. We (in Australia) occasionally hear calls for key technological decisions to be made by lay people so that the decision-making process will thereby become "more democratic". (We emphasize that we consider all such proposals to be impractical and absurd: the thought of a Citizens' Panel deciding, e.g. whether to run the computer at 100 or 150 megahertz is mind-numbing!). Nevertheless, the general point is taken: ways need to be found for Experts to contribute more effectively to public debates on technology.

In summary, we recognize that the use of Automation technologies raises matters of possible contention on ethical grounds. These relate both to the general issues of Technology-in-Society, and to the behavior of professional engineers and other practitioners in particular contexts. Although broad ethical principles can be elucidated, the application of such Principles to Practice can be extremely difficult. Since there are no prescriptive ways of determining degrees of *goodness* or of *rightness*, ethical assessments are of necessity value-based and subjective.

We welcome all constructive debate on ethical and moral issues. Nevertheless, we might reasonably expect that the protagonists will:

- be well-informed on all the relevant technical aspects (both theoretical and practical);
- be generally aware of the many vagaries and subtleties of the socio-technological issues, as briefly outlined above;
- unequivocally reject "blind fear" arguments, in all their manifestations.

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A World of Change

Dr. Robert Prandolini Editorial

Welcome

Let me welcome you to this first issue of *The Asia Pacific Channel*, the IEEE Region 10 Forum publication. Being the first issue it is my duty to register the purpose, rules and regulations of our publication. *The Asia Pacific Channel* is a special initiative of Dr. Paul Cheung, the Region 10 Director. His vision was to make members in the IEEE Asia Pacific Region more aware of the international flavor of the IEEE and of the Region 10 itself, encourage IEEE members in their professional activities and development, and to bring to member's attention the services and activities being conducted for them by the Region.

The disclaimer which would usually appear in the fine print of this publication will in this issue be brought to the top of the agenda. **Articles published by *The Asia Pacific Channel* express the author's own opinions and do not represent the opinions or policies of the IEEE.**

Since the IEEE is by far one of the best sources of learned technical publications, we felt it reasonable to make *The Asia Pacific Channel* a non-technical forum for IEEE members to discuss issues of a socio-economic nature. Thus the articles will be open to various opinions and views based on the many cultural and economic backgrounds of our members. Region 10 probably has the most diverse constituency of all the ten IEEE Regions. We can therefore look forward to many varied subjects and interesting article, and we invite them from our members. Please send them to the editor at the address on the front page.

This edition covers issues on ethics and professional ethics in community debates, technology transfer, the activities of the IEEE Transnational Committee, a report on the effect of the Kobe earthquake on the Telephone system, as well as articles from the Director.

A World of Change

The following thesis is a crystallization of the editor's evolving perspective on world culture. I have had the good fortune to have been able to meet with the chairs of IEEE sections throughout the world. Albeit that the meetings were brief and few and far between (I am no globe-trotter!), but the breadth of social developments across the world is striking and one cannot help but attempt to formulate some understanding of it. Lest we be no more than insects on this globe.

From an historical viewpoint there have been two formative economic revolutions in history. The development of agriculture which predates 2000 BC led to what we now call civilization, or more specifically, the formation of towns, cities, governments and empires. It took several millennium for it to evolve into the pre-industrial world of the eighteenth century. Then the Industrial Revolution created massive social and economic turmoil, with far reaching historical outcomes. But today no country does not embrace the industrial technology!

Humankind has therefore experienced a world of change from the very beginning of civilization, but nothing can compare with the pace of change over the last century. Our cultures have been under attack from this, and the Western culture is very much a reconstructed post-modern invention, adrift of any firm historical foundation. That is not to say that Western Culture is valueless. It just means that the historical roots of those values are somewhat lost, and consequently values now evolve with technological and societal change.

Some now say that Information Technology is becoming the third economic revolution with consequences of a similar order of magnitude to those created by the Industrial Revolution. I would concur. I cannot predict what the future social structures will be like, for we are all aware that our grandparents would not have been able to imagine today's world when they were young.

Members of the IEEE will be *the* key figures in the shaping of tomorrow's world. We need to take stock of where we have been, where we are now, and where we are going.

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Electro-technology in Asia Pacific Towards 2000

Dr. Paul Y.S. Cheung
Director
IEEE Asia Pacific Region

In five years we shall move from the 20th century to the 21st century, and no other technology has changed our lives so much as electro-technology, which engulfs the broad areas of microelectronics, computers, telecommunications and electric energy systems, and on which modern society is built. In this short article I would like to share with you my vision for electro-technology in the Year 2000 and beyond from the perspective of the Asia Pacific region. Let us first look at some numbers.

In a meeting I attended earlier this year I heard Mr. K.H. Tung, a prominent industrialist in Hong Kong, quoted some statistics which I would like to share with you. In a decade the Asia Pacific Region (including China, Korea, Singapore, Taiwan, Hong Kong, India, the Asean Countries, Australia and New Zealand) could have an economy larger than that of the EEC and NAFTA. In addition this Region is well known for its high fiscal reserves and savings rate and could double its current US$1.2 trillion annual savings to US$2.4 trillion over the same period. This means that the region will become one of the largest sources of capital in the world. Over the same period the Asia Development Bank has estimated that the Asia Pacific region will need about US$1 trillion in investment in the next 5 years for infrastructure projects alone.

This means that the Asia Pacific region is likely to become the world's largest producer and also consumer, plus interestingly its own largest lender and borrower. Its economic, technological and political influence on the world in the next decade is going to be very significant.

Now let us turn to electro-technology. While the electric power generation capacity per capita or the number of telephones per household in developed countries like the US can be considered as bountiful (or even excessive), it is by contrast rather inadequate in many parts of the Asia Pacific. This translates into enormous opportunities for development and new markets. It is estimated, for example, that over 50% of electric energy systems developed in the next 10 years will be in Region 10.

How would these developments be financed? From industry of course - manufacturing, hardware, software and service industries - and once again electro-technology plays a paramount role. Let us look at the electronics industry as an example. From a recent study by Dataquest (Report on Techno-Economic & Market Research Study on Hong Kong Electronics Industry 1993-94) the electronic industries are estimated to be some US$240 billion in Japan, US$33bn in South Korea, and over

US$12bn in Malaysia and Thailand combined. The compound annual growth rates in the region range from as high as 38% in Thailand to a few percent in Hong Kong and Taiwan. As countries like China, Malaysia, Thailand, Indonesia, India and soon Vietnam quickly move into the industrial scene and become new players in the world of manufacturing, the "Four Dragons", namely Hong Kong, Singapore, South Korea and Taiwan (note in alphabetical order only) will have to move into more value-added products and services.

This is where the IEEE and electro-technology come in. As the global and premier learned Institute in electro-technology, the IEEE has the mandate to promote, enhance and further the development of electro-technology for the benefit of humankind. IEEE provides the channel, the forum, the media and the structure for its 320,000 members plus many more non-members world-wide to share, to communicate and to learn from each other, so that our knowledge and know-how can be further developed. This is precisely why we participate in IEEE activities, Sections, Chapters, conferences, short-courses, technical meetings, and also in social events where we can share with each other.

Let me end by quoting a US lawyer at the turn of this century. He said, "The Mediterranean was the Ocean of the past, the Atlantic is the Ocean of the present, and the Pacific will be the Ocean of the future."

To meet the challenges in the 21st century, we need to work together, to collaborate, to share and to participate. With your effort in promoting and furthering electro-technology, and your support for the IEEE in its cause, perhaps making the 21st century the "Asia Pacific Century" is not a dream but a fast approaching reality.

Short Biography of Dr. Paul Y.S. Cheung

Dr. Cheung received his BSc(Eng) and PhD degrees from Imperial College of Science and Technology. He has worked with the Queen's University of Belfast and the Hong Kong Polytechnic before joining the University of Hong Kong in 1980, where he is currently the Dean of Engineering. His research interest includes computer architecture, VLSI design and signal processing. He has served IEEE in the Section, Region and Board level including the Chairman of the RAB/TAB Transnational Committee. He is currently the Director of IEEE Asia Pacific Region and member of the IEEE Board of Directors.

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Electro-Technology and Technology Transfer

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Introduction

We have seen extremely impressive progress in the fields of semiconductor ICs, aerospace technology, computing and many others during the closing decades of this 20th century. New industries in multimedia, TV broadcasting, computer, space excursions and accurate weather forecasting have become possible as a result of these technological breakthroughs. The rapid development and rate of change in these fields make it no longer feasible for one business unit, or even for one country, to be able to carry their own research and development in every key field involved in the industrialization of these technologies. Therefore it has become more and more important to promote technology transfer among industrialized countries, creating a borderless economy and the globalization of industrial entities.

Electro-Technology

Trying to define what is Technology can be a complex discussion. Let us instead give a few examples of the new technologies that have precipitated rapid growth industries. The top of our list includes fiber optics, computing, wireless communications, semiconductors, superconductors, and new materials. The progress in these technologies have new industries and new applications possible. They include globalized communication networks, multimedia, the Internet, and very fast information processing systems. The penetration of Personal Computers into business and the home is one clear example of the pervasiveness of Electro-Technology in our modern world. We also realize that additional technological developments in the areas of database retrieval, artificial intelligence and the application of robotics to replace very tedious and repetitive work are leading-edge technologies yet to reach their full potential.

Future Challenge

We have noted that new technologies in these frontier fields have brought new modern conveniences and employment to the people of industrialized countries. However, we must also face the reality that there are some gaps in the take-up of these technologies within and between countries. These gaps create social conflicts within a country as well as between countries. The term "information poor" is now used by sociologists to describe citizens without access to the Internet. Similar descriptions for inter-country discrepancies include the terms "southern versus northern hemisphere" and the "east and west", which in the global sense is a similar problem. How to solve these social conflicts will increasingly become one of the new challenges arising from our Electro-Technology Revolution. Technology transfer between countries is one solution for such a challenge.

Practical Approach to Technology Transfer

What technology is to be transferred? In order to promote technology transfer in the field of electro-technologies, it is absolutely essential for the host countries to create an environment conducive to the necessary scientists, engineers and skilled labor required for the industries and their related supporting infrastructure. A quality education system must produce sufficient numbers of graduates to achieve some "critical mass". Besides the educational, industrial, institutional and infrastructure requirements, there are numerous other challenges and financial problems which are to be addressed for the technology transfer to be successful. They include problems such as the national balance of trade, availability of foreign currency to finance purchases, the management of industries (for example the overproduction of electronic products has weakened the financial position of the IC industry), environmental protection and regulation.

It is commonly realized that the globalization of new industries requires the specialization of technologies that are most suitable for each country. What field a particular country should pursue depends upon their unique circumstances, which are not only associated with their level of industrialization, but also with their social, economic and cultural background. It is not a simple matter to transfer technologies from industrialized countries to developing countries because the global economy is too dynamic and unforgiving of economic mistakes. Therefore technology transfer in electro-technology requires constant monitoring and adjustment which is dependent on the stage of the industrialization of the host country.

Contribution of Electro-Technologies. Our societies face serious local and global problems: It is becoming necessary to forecast natural disasters and then to reconstruct the disaster areas. We need to monitor our environment both locally and globally to prevent environmental destruction. The social security of our communities depends upon restraining crime, dependable energy supply, the maintenance of a good education systems and the conservation of local cultures. We can have no doubt about the contribution of electro-technologies in addressing these problems. Consequently many developing countries greatly need technology transfer for the modernization of their communities and institutions.

Technology transfer can be accomplished not only through high level government policies that might require the collaboration at a government level in the corresponding countries, but also through the collaboration among industrial groups, institutions and volunteer organizations in different countries. The IEEE is playing a large role in technology transfer between countries. Because it is a transnational organization, technological information is readily available in all parts of the world. This is one of the main objectives of the IEEE's learned society charter, which we feel is being successfully achieved.

Short Biography of Dr. Seiichi Takeuchi

Dr. Seiichi Takeuchi was born on 17 January 1936. He received his MS and PhD degrees from the Polytechnic Institute of Brooklyn in 1968 and the New York University in 1974 respectively. He was a research fellow at the Microwave Research Institute at the Polytechnic of New York before he joined Sumitomo in 1974.
Dr. Takeuchi is presently the Corporate Senior General Manager of Sumitomo

Electric Industries. He has served on many professional committees including the IEEE International Liaison for TAB (Technical Activities Board).

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Large Scale Urban Disasters and Telecommunications Networks

Dr. Keiji Tachikawa
Executive Vice President
Nippon Telegraph and Telephone Corporation

The Kobe Earthquake

A severely damaging vertical lifting earthquake occurred at 5:46 on the morning of January 17, 1995 in Kobe City near Osaka, Japan. Its epicentre was 20km below the surface with a great proportion of its impact heavily effecting the populated urban area. The magnitude was 7.2 on the Richter scale and the disaster killed approximately 5,500 people with more than 100,000 residences and buildings destroyed.

Japan happens to lie within a very geological active region of the earth, and regularly experiences a large number of earthquakes. Analysis of geological records reveals that large tremors resulting in loss of lives and damage to property occurs on average five times a year. Very large seismic events with a magnitude of 7 or greater occur approximately once every two or three years. Moreover, approximately 10 percent of all measurable earthquakes are centered under the region including Japan and its environs. The greater proportion of these are horizontal tremors occurring as the result of sliding at borders between plates under the sea surrounding Japan.

The Kobe earthquake was not one of those typical events, but rather involved a sharp vertical rise and fall at a fault line. Such events are thought to occur, on average, only every few thousand years. But when they do the damage is great.

Most of the telecommunications facilities affected by this disaster consisted of subscriber loop cable and wiring, subscriber loop switches and buildings. In the Kobe earthquake overall damage totaled approximately 30 billion yen. Destruction of telephone poles and buildings, as well as the numerous fires that followed the earthquake, caused failure to most aerial cables. Services to almost two hundred thousand subscribers were interrupted.

Damage to underground facilities such as cables in conduits was relatively minor, thus proving their overall reliability. Recovery for subscriber loop cables, however, was drastically delayed due to widespread destruction of residences and other buildings. Temporary facilities were used to get services back up within two weeks of the earthquake. Full service was restored eight weeks later.

Subscriber loop switches were themselves untouched. Such factors as long-term unavailability of public power supplies, as well as damage to backup batteries and emergency power generating equipment all combined to ensure that eleven switches in seven locations went down. Measures to bring them back up included bringing mobile power generating trucks to the area and all units were back functioning by the morning of the day after the earthquake.

NTT's building housing important telecom facilities have all been designed to seismic specifications. Damages to them were well within design parameters, and were not a factor directly affecting telecom system performance.

Telephone traffic after the earthquake, however, went far beyond anticipated levels, being 50 times as much as normal traffic on average. This was predominantly due to calls within and outside the area to confirm the safety of individuals, and resulted in most callers hearing a busy signal. In order to accommodate the necessary volume of emergency calls within the area as well as high-priority calls from outside the region, NTT conducted traffic control measures while also carrying out emergency expansion of circuit capacity. Nonetheless, we were not able to get traffic overflow under full control until one week after the earthquake.

NTT installed 3,000 new public telephones for the 300,000 residents of the area taking refuge in public accommodations, after suddenly finding themselves homeless. Satellite communications were an essential key to quickly getting this many new public phones up and functioning.

One major factor inhibiting the speed of recovery was the utter devastation to the public road and highway network. Numerous serious breaks in the road surface as well as other types of obstructions meant that trucks and other vehicles could not reliably transport cable-laying equipment. Every possible alternative such as helicopters (and under-sea cabling ships) were thus employed to get water, food, necessary materials, disaster workers and lines into the devastated area.

Disaster Countermeasures

Based on earlier experience with various types of disasters, NTT has been improving a lot of its counter measures against disasters, focusing on:

- enhancing system reliability,

- preventing communications service interruptions, and

- assuring quick service recovery.

A quick overview of major preventive measures looks like this:

- Enhancing System Reliability - Measures toward this focus have included: strengthening conduits, buildings and towers housing communications facilities; distributing long-distance switching equipment in such a way as to prevent breaks in trunk-call routing (separating them by more than 50km); and implementing automatic switchover systems providing multiple call relay routes including options away from disaster area.
- Preventing Communications Service Interruptions - Measures have included establishing radio facilities capable of supporting minimum essential communications capabilities in local government offices for each city, town and village.
- Assuring Quick Service Recovery - Measures toward this focus have included provision of: emergency-use portable telephone switches; power supply trucks;

portable radio equipment; mobile satellite communications system earthstations; and emergency cable stock.

Conclusion

All measures have proven useful, and are in place nationwide. Another indispensable tool here has been regularly scheduled, periodic disaster training drills. Preventive measures in place before the disastrous Kobe earthquake were seen to work well when that quake hit. Design goals were met.

One phenomenon that was not well provided for, however, was the huge volume of telephone traffic that was experienced over the hours after news of the earthquake spread. Lack of capacity led to a very high rate of no-connects over a long period of time. Another improvement required is for the delivery of information to people who had to take refuge elsewhere after the destruction of their homes and property. Existing modes of communication were not up to the extraordinary demands of those first few hours and days.

To better prepare for the unfortunate events of such a large-scale disaster in the future, we are now laying plans for a stronger, more comprehensive response. Areas we are currently putting into active practice include: decreasing the required time for housing communications cable in underground conduits and pipelines; introducing more portable satellite communications systems; implementing robust voice mail systems capable of alleviating some of the worst aspects of traffic overloads at a time of crisis; and designing and constructing a disaster-region network capable of effectively delivering information to individuals and the public at large when their homes and places of work may have been badly damaged or destroyed.

One thing NTT certainly learned from this disaster was the importance of every-day planning and preparations for seemingly unlikely events - "Always be prepared".

Short Biography of Dr. Keiji Tachikawa

Dr. Keiji Tachikawa received his bachelor's degree from the Tokyo University in 1962, a MBA from MIT in 1978 and his doctorate in engineering from the Tokyo University in 1982. He has held many positions with Nippon Telegraph and Telephone Corporation (NTT) and is presently the Executive Vice President and Senior Executive Manager for Service Engineering Headquarters with NTT.

He is a senior member of IEEE and chief of the Tokyo region of Institute of Electronics, Information and Communications Engineers (IEICE) which is the largest communications-related technical institute in Japan.

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The RAB/TAB Transnational Committee

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Vice Chairman
Sumitomo Electric Industries Ltd.

It is my great pleasure to submit my message to the IEEE members of Region 10. As the past Director of Region 10, I would like to congratulate you in establishing the *Asia Pacific Channel*. It is my pleasure to observe this development and I congratulate the current Region 10 Director, Dr. Paul Y. S. Cheung, for his initiative. I have been serving the IEEE members as Chair of the RAB/TAB (Regional Activities Board / Technical Activities Board) Transnational Committee for 1995 after the former Chairmanship of Dr. Paul Cheung. I am quite sure that the RAB/TAB Transnational Committee has many things in common with IEEE members in Region 10 in promoting the mission of the IEEE. As stated by the IEEE Charter, the scope of the RAB/TAB Transnational Committee is to encourage and facilitate transnational activities within the IEEE. One of the committee's functions is to identify and clarify areas of interest in transnational matters, particularly those involving the Regions 7, 8, 9 and 10. These matters include: a) The relationships between the IEEE and other technical organizations based in the Regions. b) Transnational technical activities such as conferences, lecture tours and exchange programs held in the Regions. c) Operational problems unique to Regions 7, 8, 9 and 10. The other function is to maintain guidelines for the structure and administration of delegations, study groups, visiting teams and other transnational activities. The committee members are composed of representatives from RAB and TAB and some other appointees.

In this conjunction it is my pleasure to summarize what has been accomplished by this committee. As Chair of RAB/TAB Transnational Committee in 1995, after having completed my term as the Region 10 Director in 1993-1994, I proposed the following three goals at the beginning of the committee meeting in March 1995: a) Membership Development, b) Cooperation with national societies and c) the enhancement of the public image of the IEEE so as to transform the IEEE into a true global organization. I am pleased to report that significantly progress has been made in achieving these goals. Seven areas of major importance were recognized and below is a summary of the actions achieved:

Eastern Europe Projects: I do not need to spell-out the history of why the IEEE had no operations in Eastern Europe, however, the first shipment of IEEE periodical microfiches for Eastern Europe libraries has been delivered, and a proposal is under way to develop summer schools in Eastern Europe.

*Members Services:*Since March 1995 the IEEE has successful operated a Membership Help Desk for Region 9. We have also implemented in many countries the facility for membership dues to be paid in local currencies, and established a minimum income policy for society membership.

National Society Agreements: Agreements have been made with The Institute of Electronics and Telecommunication Engineers of India (IETE), and The Institute of Engineers, Australia (IEAust). The next possible action would be for Sections to approach and make agreements of cooperation with their national society in Regions 8, 9 and 10.

*Industry Relations:*Several study tours and VIP visits have been made including the visits to Japan by Dr. Tom Cain and Dr. Wallace Read in April 1995, the Australia and New Zealand IEEE Colloquia visit in August 1995 to promote cooperation with industries, and other visits to countries in Regions 8, 9, and 10 by TAB and IEEE Executive Committee members.

*Section Support:*A Russian Section Office has been establishment for a three year trial.

*Database:*Statistics on the number of electrical, electronic and computer engineers in the Regions have been collected. This will help the IEEE in planning support for new and young Section.

Society & Region Cooperation: We have worked on developing a preliminary model for all IEEE Societies. The idea is that the Sections are a vehicle for transnational activities by the Societies. A survey has been compiled on the technical activities of Societies and Regions. The Brussels and the Singapore offices are facilitating the interactive connection between Sections and Societies. We have also been discussing the possible reproduction of the IEEE Globalization Newsletter.

The committee has an important role in establishing communication channels with national societies and industries in each country, with the aim of transforming the IEEE into a global organization. I am happy to serve as a bridge between the IEEE and academia as well as industries world wide, especially for Region 10.

Short Biography of Dr. Tsuneo Nakahara

Dr. Nakahara received his B.E. and Ph.D. in Electrical Engineering from the University of Tokyo in 1953 and 1961. He joined Sumitomo Electric in 1953 and has held many important positions where he currently is the Vice Chairman of the company. He has held many important public offices in various institutions Internationally and in Japan. These includes Vice President of The Engineering Academy of Japan, Member of the Board of Trustee for the Polytechnic University in New York. He received a Blue Ribbon Medal from The Emperor of Japan for his contribution to fiber optics in 1994. Dr. Nakahara has served the IEEE in many key positions including Region 10 Director 1993-1994 and the RAB/TAB Transnational Committee Chairman in 1995. He is currently the 1996 IEEE Secretary.

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URL: http://www.ehw.ieee.org/reg/10/nl_a7.htm
(Modified:12/19/06)

Congratulations to the New Director-Elect

Mr. Harban Bajaj has been elected to the position of IEEE Region 10 Director-Elect in 1996. He will take up the office of Region 10 Director for 1997-98 in January 1997. Congratulations!

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1996 Region 10 Committee Meeting,

Hong Kong

The 1996 Region 10 Committee Meeting will be held in Hong Kong on 12-13 April, 1996. This will coincide with the 25th Anniversary celebration of the IEEE Hong Kong Section. In addition to the Regional Officers and Section Chairs, the event will be attended by IEEE President Read, VP Findlay (RAB), VP Eisenstein (TAB), VP Jeargan (Education), a few Directors and Society Presidents.

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