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**PRESIDENT'S MESSAGE**

Ramesh B. Malla, Ph.D.

President, American Society of Nepalese Engineers (ASNEng)  
Connecticut, U.S.A.

With great pleasure and honor, I take this opportunity to present to you the third comprehensive issue of the Newsletter of the American Society of Nepalese Engineers (ASNEng). In this newsletter, you will find some of the key activities and accomplishments of the Society for the last 1 year.

The Society will be soon 5 years old (established in September 2007). Within this short span of time, ASNEng has established itself on a strong foundation and has become the prominent and highly regarded professional society of Nepali engineering and scientific diaspora communities. Last one year, the Society saw unprecedented level of activities and growth. I would like to highlight a few of the major activities and accomplishments of last year.

The Society took the lead to organize the very successful Joint ASNEng/CAN-USA (Computer Association of Nepal-USA) Annual Conference in Houston, TX; July 09-10, 2011. It was a landmark and one-of-its kind conference in that it is being organized stand-alone, independent of other Nepali organizations, for the first time in both organizations' history. Special thanks and Congratulations to the host of the Conference: the Greater Houston Engineering and Scientific Community and the Nepalese Student Association at the University of Houston Clear Lake.

Another historic event took place in the August of 2011. Congratulations to members of the Nepalese engineering and scientific community of the Greater Washington D.C. (GWDC) area for successfully establishing the very first chapter of ASNEng. The ASNEng Board of Directors approved the formation of the GWDC Chapter at its meeting on August 07, 2011. Moreover, it gives me great pleasure to write that the newly formed GWDC Chapter of the Society hosted the extremely successful 2012 Joint ASNEng/CAN-USA Annual Conference in Leesburg, VA during May 26-27, 2012. This year's conference made history in several fronts, including attendance, sponsorship, and additions of new features like Best Presentation Awards and professional development lectures by industry representatives. There were about 160 participants who came from about 15 States in the U.S., Canada, and Nepal. Sincere thanks and congratulations to the GWDC Chapter and all local volunteers who helped make the conference a grand success.

In October of 2011, several members of the ASNEng Board of Directors, led by Vice President Rajendra Shrestha, Ph.D. and Vice Chair of the Technical Committee, Kanhaiya Kayastha, P.E., S.E., represented the Society at the NRNA Global Conference in Kathmandu, Nepal. The team also met with prominent individuals at several organizations in Nepal and discussed on collaborative activities. In November 2011, the Society published the final "Guidelines for Scholarships, Awards and Grants" and has been actively seeking funds and donations to provide a couple of students' scholarship in the near future.

ASNEng has been taking lead role in the Joint Initiative with ANMF and CAN-USA on Earthquake Disaster Preparedness in Nepal. It has continued collaborative activities with several Nepali diaspora organizations in the U.S., e.g., NRN-NCC, ANA, ANMA, and NASEA. Likewise, it have been actively moving ahead to collaborative endeavors with organizations in Nepal, including Ministry of Science and Technology, Nepal Academy of Science and Technology, Institute of Engineering, and National Society for Earthquake Technology and has been exploring various ways for transferring technology to Nepal.

*(Continued on page2)*

**PRESIDENT'S MESSAGE**

(Continued from page 1)

I invite you to regularly visit ASNEng Website at <http://www.ASNEng.org> to learn more about the Society and to keep informed about the Society's forthcoming activities. Since ASNEng is a membership-based institution, support from each of us in the community is vital to empower the Society to champion our common cause and channel our voluntary effort and energy for the good of humanity. Therefore, I invite you to join the Society and take active part in its many exciting forthcoming activities and events.

I take this opportunity to thank all ASNEng members and friends of the Society for their continued support. Thanks are also due to Officers, Society Directors, and members of various committees of the Society for their significant voluntary time and support. I extend a very special thanks and appreciation to the members of the Newsletter Committee for their time and diligent effort in publishing this issue of the Society's Newsletters. I hope that you would enjoy this issue of the ASNEng Newsletter and continue to support the Society and actively participate in its activities.

As a final note, the Officers and Society Directors for the 2012-14 terms (effective June 27, 2012) have been elected. The election result was announced at its Annual General Membership Meeting held in Leesburg, VA on May 27, 2012 (Please see a separate article on this somewhere below.) On behalf of the Society and myself as the outgoing President, I would like to sincerely thank the outgoing Officers and Directors who served during the 2010-2012 term. I congratulate all newly elected Officers and Directors and wish them all the best and good luck for their tenure on the respective positions. Last but not least, I express my sincere thanks and deepest gratitude to all members of ASNEng and the general Nepalese engineering and scientific communities and friends for entrusting me on the Society's President's position and providing overwhelming support throughout my tenure during these first 5 years of the Society's life.

Sincerely,



Ramesh B. Malla, Ph.D.  
President  
American Society of Nepalese Engineers (ASNEng)  
Connecticut, U.S.A.

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**Message from the  
ASNEng Newsletter  
Committee**

We are very excited to bring forward Volume 3 of the ASNEng Newsletter. In this issue we have introduced a new section entitled – “Chhoto Chinari”, which will feature distinguished professionals from the Nepali engineering and technical community.

The Newsletter Committee would like to extend its sincere thanks to all those who have provided their valuable suggestions, comments, input/feedback, and contributed news and articles. Without your constant patronage, we wouldn't have been able to get to this point. We sincerely hope that you will continue to provide constructive suggestions and feedbacks for improving the quality of the Newsletter. We also request you to keep on sending news items, technical articles and other interesting pieces that would appeal to the mass readers. Please send your contribution to the newsletter committee at [newsletter@asnengr.org](mailto:newsletter@asnengr.org). Please note that the newsletter committee reserves its exclusive right to determine suitability of the news and articles for publication.

**ASNEng Major Events****2011 Joint ASNEng/CAN-USA Annual  
Conference at Houston, TX; July 9-10.**

American Society of Nepalese Engineers (ASNEng) and Computer Association of Nepal-USA (CAN-USA) held a very successful fourth annual conference jointly on July 09-10, 2011 at the University of Houston in Houston, Texas, U.S.A.

The theme of this conference was “Engineering, Science, and Technology for Sustainable Development of a Developing Country” which drew participants from various states in the USA, Nepal and other countries. It was the first stand-alone conference for both ASNEng and CAN-USA which provided a common ground for technical professionals to discuss topics including but not limited to, Earthquake Preparedness and Disaster Relief in Nepal, Renewable Energy Technologies and Engineering Advances, and Advances in Infrastructure Design and Management.

The 2-day event started with the opening ceremony by dignitaries including the Honorable Mr. Hubert Vo, State Representative of Texas and Mr. Gordon Quan, Immigration Attorney and former Houston City Council Member, Foster and Quan, LLP, Houston, TX.

There were 4 technical sessions: “Joint ANMF/ASNEng/CAN-USA initiative on Earthquake Preparedness and Disaster Relief in Nepal”, “Earthquake Consideration and Flood Analysis in Nepal”, “Renewable Energy Technologies and Engineering Advances”, and “Advances in Infrastructure Design and Management”. All of these sessions had several 45 minutes long presentations from wide range of presenters including a few from Nepal via Skype. The event ended with a sight-seeing tour for the visitors around the Greater Houston area by the courtesy of the Greater Houston Nepalese Engineering and Scientific Community.

Overall, it was an excellent event with flawless execution by the local organizing committee in Houston led by the Vice Present Rajendra Shrestha. The event was attended by a record number of about 80 participants. It enjoyed support from 8 sponsors and donors. The 2011 Conference set an exemplary precedence for future conferences to come.



Some attendees at the ASNEng/CAN-USA Joint Conference at Houston, TX – July 9-10, 2011

### Formation of the DC Chapter of ASNEng

*Prepared by: Thakur Dhakal (Vice President, the DC Chapter of ASNEng)*

The engineering and scientific communities in DC metro area started to come together, exchange ideas, and support each other in a non-organized way since long time before. However, coordinated and larger gatherings were started since 2008. The first family gathering initiated by Rishi Baral and Ram Lal Shrestha to include engineers graduated from the Pulchowk Engineering Institute, living in the DC metro area was organized on January 12,

2008 in Greenbelt, Maryland. More than 30 professionals in the region attended that family gathering.

As a follow-up to that gathering, a need was felt to have a more organized networking, communication, and sharing of knowledge among Nepalese engineering, scientific, and technological communities. Bearing that fact in mind, the “Engineering Sajh” was organized on November 20, 2010 to reach a broader spectrum of engineering and scientific community, which turned out to be a starting point to form “The DC Chapter of ASNEng”. More than 75 engineers, scientists, and technological professionals across the region participated that get-together,, which included His Excellency Ambassador of Nepal to the USA, President of ASNEng, and other distinguished professionals.

A participant survey was conducted during the program, according to which 95% of the participants were in favor of some kind of professional forum, and more than 68% opted for establishment of the DC Chapter of ASNEng. After several meetings and brainstorming following the Engineering Sajh, we reached the following conclusions:

1. We have an urgent need of a professional forum to share our knowledge and experience that could benefit ourselves, professional societies, industries, and our birth place Nepal in many ways.
2. Our interest best fits with the interest of American Society of Nepalese Engineers (ASNEng) and forming Local Chapter would be the best alternative solution.

Many professionals including Yubaraj Budhathoki, Deependra Pokharel, Shalik Wagle, Kulmani Acharya, Raj Tamang, Prakash Khanal, Rishi Baral, Santosh Dhakal, Shashi Dahal, Indra Poudel, Rajendra Tamrakar, Jagannath Ghimire, and Thakur Dhakal were very active in identifying agenda for a professional forum, conducting meetings and conference calls, and participating in discussions. Several announcements were made through local and national media for the formation of a professional forum. After several meetings, conference calls, and gatherings, a meeting of professionals held on May 21, 2011, decided to form an Ad-Hoc committee on the chairmanship of Mr.Yubaraj Budhathoki and authorized the committee to file an application to establish a local chapter in this region. The complete list of the Ad-Hoc committee consists of Mr. Yubaraj Budhathoki (President), Mr. Thakur Dhakal (Vice President), Mr. Deependra Pokharel (General Secretary), Mr. Shalik Wagle (Treasurer) and the Directors Mr. Kulmani Acharya, Mr. Raj K Tamang, Mr. Raj

K Tamang , Mr. Prakash Khanal, Mr. Rishi Baral, Mr. Santosh Dhakal, Mr. Shashi Dahal, Mr. Lok Darshan Shrestha, Mr. Pradeep Gautam, Mr. Indra B. Poudel, ,Mr. Rajendra Tamrakar and Mr. Jagannath Ghimire.

The committee was given a responsibility to conduct an election of the Chapter in accordance with the ASNEng bylaws by July 2012. The formation of the elected body would automatically dissolve the Ad-Hoc committee.

The committee then decided to establish the local chapter named as “**The Greater Washington, D.C. Chapter of ASNEng (GWDC ASNEng)**”. After necessary bylaws preparations and documentation, the Committee filed the application for the formation of the chapter on July 9, 2011, with ASNEng during the 4<sup>th</sup> Annual Conference of ASNEng/CAN-USA in Houston, Texas. At the same time, the committee also presented the bid to host the 5<sup>th</sup> annual conference of ASNEng in the DC metro area. Both applications were approved by ASNEng Board of Directors on August 7, 2011.

The GWDC Chapter organized a historic and very successful event of 5<sup>th</sup> Annual Conference of ASNEng in Leesburg, VA during May 26-27, 2012. The conference was a joint conference of ASNEng with Computer Association of Nepal (CAN)-USA. More on the Conference will follow in the next Newsletter. The Conference details can be found on the ASNEng website at <http://www.ASNEng.org>.

### **Joint ANMF/ASNEng/CAN-USA Session on Earthquake Preparedness and Disaster Relief in Nepal at ANMA/NASeA Convention on September 04, 2011**

*Prepared by: \_ Prakash B. Malla, Ph.D. & Bishnu Phuyal, Ph.D.*

A joint session of America Nepal Medical Foundation (ANMF), American Society of Nepalese Engineers (ASNEng) and Computer Association of Nepal-USA (CAN-USA) on “*Earthquake Disaster Preparedness and Relief in Nepal*” was held at the NASeA/ANMA Convention in Atlanta, Georgia, on September 04, 2011. This session was coordinated by the Members of the Board of Directors-ASNEng, Dr. Prakash B. Malla and Dr. Bishnu Phuyal. Dr. Malla welcomed the attendees and set the stage for the session by asking a question “Is the Earthquake Risk in Nepal Real?” and providing the historical/statistical as well as geological reasons for great

concerns and disaster preparedness and relief.

On behalf of ASNEng President Dr. Ramesh B. Malla, Dr. Bishnu Phuyal, Member of the ASNEng Board of Directors, provided a quick update on the activities of the American Society of Nepalese Engineers. These included a brief history of the society, objectives, current officers and BOD, various committees, and ongoing projects and activities including joint efforts with other associations. He also distributed the membership forms and encouraged the engineers, scientists and technical professionals to join the society as members.

On behalf of ASNEng President, Dr. Ramesh B. Malla, Ph.D, Dr. Prakash Malla then gave the ASNEng presentation on “*Earthquake Disaster Preparedness and Relief in Nepal- Infrastructure Safety and Security.*” This presentation began with highlighting the essential elements of the position paper that is currently under preparation by the three participating organizations, ASNEng, ANMF and CAN-USA, dealing in their areas of expertise on engineering/structures, medical/health, and computer/ communications. The position paper focuses in three major areas of concerns that can occur during, after and prior to an earthquake episode and will include brief guidelines and action items to ensure maximum human-life-safety and minimum loss of public and private properties in future earthquakes in Nepal. Dr. Malla then moved into the safety and infrastructure challenges, including the explosive growth of population and rapid construction of high-rise apartment buildings in Kathmandu, lack of proper implementation & strict adherence to building code standards, and lack of quality construction practices. Finally, several recommendations were provided to improve the infrastructure issues.

Dr. Bishnu Phuyal delivered the CAN-USA presentation on “*Earthquake Preparedness and Disaster Relief in Nepal – Information Technology and Communication*” on behalf of CAN-USA President, Nabin Khanal. This presentation highlighted two realms of communications technology that are importance for disaster preparedness and relief, namely Telecommunications and Geographic Information System (GIS). A good telecommunication system is the central nervous system of any search and rescue or re-supply effort. It will save lives by allowing first responders to be quickly and optimally deployed and survivors to inform rescuers of their locations. The most asked question after a disaster is “WHERE”: where is the damage, where are likely survivors/needly people, where should the rescue efforts focus, where do we start, etc. A sound Geographical Information System is essential to address these equations.

Dr. Gaury Adhikary, MD gave the ANMF presentation on

*“Earthquake Preparedness and Disaster Relief in Nepal – Medical and Public Health.”* Dr. Adhikary began with providing an update on the ANMF mission, activities and current projects. He then discussed the importance of having both immediate and long-term plans in the event of disaster. The immediate issues would involve logistics with communication such as setting up of supply line for food, water, hygiene and shelter as well as medical issues, such as recovery of life and limb, containment of infectious disease spread, supply of medicine, medical equipment and personnel, setting up of mini tent hospital for wound care, amputation, resuscitation, deployment of specialists (surgeon, anesthesiologists, orthopedic surgeon, ER Physicians, skilled nursing) and ancillary health workers. The long term medical issues should incorporate rehabilitation and continued support, reconstructive surgeries, immunization, clean water , prevention of infectious disease (dysentery, TB, etc), setting up primary care centers at community level, and counseling. He further emphasized the importance of preventive measures to prepare the healthcare workers and minimize injuries as well as loss of lives such as hospital/clinic disaster plans, staff drills, structural improvements to hospitals and hospital rooms outfitted to sustain earthquakes.

The session was well received. There was an interesting and productive discussion after the individual presentations. The attendees were requested to send their comments and suggestions to the presenters via email.

### **Representation of ASNEng at the 5<sup>th</sup> NRN Global Conference, Kathmandu, Nepal**

*Prepared by: Rajendra K. Shrestha, Ph.D. and Kanhaiya Kayastha, S.E., P.E.*

American Society of Nepalese Engineers (ASNEng) was represented by Dr. Rajendra Shrestha, Vice President and Mr. Kanhaiya Kayastha, Member, member of the Board of Director at the 5<sup>th</sup> Non-Resident Nepali (NRN) Global Conference organized in Kathmandu, Nepal, on Oct. 12 – 14, 2011. Also present in the conference were Dr. Ambika Adhikary and Mr. Naresh Koirala, Members, Board of Director, and Dr. Prahlad Pant, Fellow and Chair of the Nomination/Election Committee, ASNEng.

The purpose and activities of ASNEng were introduced and briefed to the Nepali diaspora and the local Nepali communities on several occasions during, pre- and post-conference events/programs/meetings throughout the month of October, 2011. These efforts were geared to enhance the visibility of ASNEng and give it an

appropriate exposure to all the individuals, organizations and institutions that Dr. Shrestha and Mr. Kayastha had the opportunity to contact and hold meetings with.

The 5<sup>th</sup> NRN Global Conference, participated by more than 1,000 Non-Resident Nepalis from 56 countries across the globe, with more than 90 participants from the U.S.A., was inaugurated by the Prime Minister, Government of Nepal, on Oct. 12, 2011. At the conference, on behalf of ASNEng, Mr. Kayastha and Dr. Shrestha made a joint presentation entitled “Earthquake Hazards in Nepal and Joint Effort in its Preparedness and Disaster Relief” (authored by K. Kayastha, R. B. Malla, and R.K. Shrestha) in the panel discussion on “Role of NRNs in Disaster Relief of Nepal” chaired by the United States Ambassador to Nepal His Excellency Mr. Scott H. DeLisi. The status and highlights from the position paper on “Earthquake Preparedness and Disaster Relief in Nepal” being prepared jointly by ASNEng, America Nepal Medical Foundation (ANMF) and Computer Association of Nepal –USA (CAN-USA) were also updated during that presentation. The background information about the joint initiative was briefly reviewed with H.E. Mr. DeLisi on Oct. 10 at the dinner hosted by the U.S. Embassy in Nepal to NRN-USA delegates in Hotel Annapurna.

A comprehensive meeting organized by the U.S. Embassy in Nepal on Oct. 21 was participated by H.E. Mr. Scott H. DeLisi, Mr. David Atteberry, Mission Director, US Agency for International Development (US-AID), Ms. Sheila Roquitte, Disaster Risk Reduction Office Director, US-AID, Mr. Santosh Gyawali and Mr. Bal Krishna Parajuli, Disaster Risk Reduction Office, US-AID, Dr. Rajendra Shrestha, ASNEng, Mr. Kanhaiya Kayastha, ASNEng, Mr. Amod Dixit, National Society for Earthquake Technology-Nepal (NSET), Dr. Pradeep Vaidya, ANMF-Nepal, Mr. Bijaya Niroula, CAN-USA, Mr. Binod Dhakal, CAN and representatives from US Embassy and US-AID/Nepal. Dr. Shrestha and Mr. Kayastha presented the salient features of the “Earthquake Preparedness and Disaster Relief for Nepal” joint initiative, Mr. Niroula presented a proposal for the disaster web-based portal, Mr. DeLisi made some useful comments about disaster relief in Nepal, Ms. Roquitte added a brief account of the disaster mitigation plan of US-AID, Dr. Vaidya discussed about the HOPE program that he was involved in and Mr. Dixit briefed NSET’s disaster relief program in that meeting.

Dr. Shrestha and Mr. Kayastha availed the opportunity of meeting the officials of National Academy of Science and Technology (NAST) chaired by the NAST Vice Chancellor Dr. Surendra R. Kafle along with the representatives of NRN Skills, Knowledge, and

Innovation (SKI) Task Force in the NAST office, Khumaltar, Lalitpur on Oct. 17. During the meeting, Dr. Kaffle was made aware of the ASNEng/ANMF/CAN-USA Joint Initiative and that a copy of the position paper would be presented to him upon its completion.

On Oct. 20, a meeting was held at the Institute of Engineering (IOE) with Dean Dr. Bharat Pahari, Assistant Dean Ms. Timila Yami Thapa, Assistant Dean Mr. Ram Chandra Sapkota, Dr. Jibaraj Pokhrel, Dr. Jishnu Subedi, Mr. Hari Darshan Shrestha and its faculty members at the Pulchowk Campus. The discussion focused on various avenues of mutual interest where ASNEng and IOE could cooperate in the days ahead. Subsequently, as a follow up, Dr. Shrestha and Mr. Kayastha made presentations to the faculty and students of IOE on Oct. 23, on “Earthquake Preparedness and Disaster Relief for Nepal” organized by the Structural Engineers’ Association of Nepal (SEANEP), which was well-attended and well-received. Mr. Naresh Koirala and Mr. Gopal Shah from ASNEng and SEANEP members were also present. IOE was in the process of launching a Master’s degree program in Disaster Risk Management, at that time.

Mr. Ganesh Rai, Acting CEO of the Kathmandu Metropolitan City was made aware of the earthquake preparedness in Nepal joint initiative at a dinner hosted to the NRN executive members by his office at Nepali Chulho, Lazimpat on Oct. 17.

In addition Dr. Shrestha and Mr. Kayastha attended a reception hosted by the Vice President of Nepal Honorable Mr. Parmananda Jha at his office in Bahadur Bhawan on Oct. 17 and a meeting organized by Federation of Nepalese Chambers for Commerce and Industry (FNCCI) for the NRN delegates at its office in Teku on Oct. 19. The meeting focused on different investment possibilities to Nepali diaspora in Nepal. It was also discussed that the technical expertise, knowledge and experience contributed by Nepali diaspora in Nepal’s development must also be considered as man power investment to Nepal.

NSET hosted a meeting with lunch at its office in Bhainsepati, Lalitpur, on Oct. 24, attended by ASNEng representatives Dr. Shrestha, Mr. Kayastha, Mr. Gopal Shah and NSET Chair Mr. Shiva Bahadur Pradhananga, Executive Director Mr. Amod Mani Dixit and the NSET Staff members. Mr. Dixit presented NSET’s current activities, accomplishment and future programs at length, during the meeting.

Therefore, all in all, ASNEng members had a successful meetings and interactions providing the Society

significant exposure and visibility at the 5<sup>th</sup> NRN Global Conference in October 2011 and after.



Dr. Shrestha, H.E. Mr. DeLisi, Dr. Mahato and Mr. Kayastha (left to right) at the inauguration of the 5<sup>th</sup> NRN Global Conference on Oct. 12, 2011).



Dr. Shrestha making presentation at the 5<sup>th</sup> NRN Global Conference.



Mr. Kayastha making presentation at the 5<sup>th</sup> NRN Global Conference.

## **ASNEngr Activities for the Earthquake Preparedness and Disaster Relief in Nepal**

Since the beginning of 2010, ASNEngr, CAN-USA, and ANMF have been actively working together to assist Nepal for earthquake preparedness. In March 2010, ASNEngr/ANMF/CAN-USA initiated the preparation of a position paper on Earthquake Preparedness and Disaster Relief in Nepal. Many Nepali Diaspora organizations in the U.S. and beyond and several organizations in Nepal have been serving as supporting organizations. Since then many activities have been accomplished under the leadership role of ASNEngr. The Full Committee of the joint earthquake initiative meets every 3 months and the Steering Committee has been meeting every month. Ramesh B. Malla, Ph.D, President of ASNEngr is serving Chair of these joint committees. The position paper is in its final leg of preparation.

Given below are some of the main conference and meeting presentation activities organized and executed under this joint initiatives. ASNEngr played lead role in organizing them unless otherwise indicated:

- A joint panel discussion with 4 panelists on “Earthquake Disaster Preparedness in Nepal” at the 2010 in the 4<sup>th</sup> NRN Regional Conference held at Houston, TX on May 28, 2010.
- A technical Session with 3 presentations on “Earthquake Disaster Preparedness in Nepal” at the Joint ASNEngr and CAN-USA Conference in Boston, MA; July 03-04, 2010.
- A Joint ANMF/ASNEngr/CAN-USA Session with 3 presentations on “Earthquake Disaster Preparedness in Nepal” at ANMA/NASeA Convention in Lexington, KY; September 04- 05, 2010
- ANMF/ASNEngr/CAN-USA Presentation on Earthquake Preparedness and Disaster relief in Nepal at the NRN Tele-Conference on May 15, 2011
- Two sessions titled “Joint ANMF/ASNEngr/ CAN-USA initiative on Earthquake Preparedness and Disaster Relief in Nepal”, and "Earthquake Consideration and Flood Analysis in Nepal" at the 4th Joint ASNEngr/CAN-USA Annual Conference held at Houston, TX; July 09-10, 2011. These sessions included 8 presentations.
- A Joint ASNEngr/ANMF/CAN-USA t session with 3 presentations on “Earthquake Preparedness and Disaster Relief in Nepal” at the Joint ANMA/NASeA Convention , Atlanta, GA; September 03-05, 2011.
- In September 2011, CAN-USA held a one day event called 'Hackathon for Nepal' in Oakland, CA to "create a portal containing vital information to help community members and well-wishers both before and after a devastating earthquake."
- Presentation on topic “Earthquake Hazards in Nepal and Joint Effort in its Preparedness and Disaster Relief” in the session entitled “Role of NRNs in Disaster Relief of Nepal” at the 5<sup>th</sup> NRN Global Conference, Kathmandu, Nepal; October 12-14, 2011.
- Presentation on “Earthquake Preparedness and Disaster Relief for Nepal” organized by the Structural Engineers’ Association of Nepal (SEANEP) at the Institute of Engineering, Pulchowk, Lalitpur, Nepal; October 23, 2011.
- Meetings of representatives of ASNEngr, ANMF, and CAN-USA with prominent members of several organizations, including Nepal Academy of Science and Technology (NAST), National Society for Earthquake Technology (NSET), Institute of Engineering (IOE)/Pulchowk, U.S. Embassy, U.S. AID, Kathmandu Municipality and others, in Nepal in the month of October 2011 and discussed on the Earthquake preparedness and disaster relief in Nepal.
- Two sessions titled “Joint ANMF/ASNEngr /CAN-USA initiative on Earthquake Preparedness and Disaster Relief in Nepal”, and “Earthquake Safety Engineering and Information Communication Technologies” at the Joint ASNEngr/CAN-USA Annual Conference; Leesburge, VA; May 26-26, 2012. These sessions consisted of 9 presentations.

## **Disaster Preparedness Nepal: The Switchboard Concept (a.k.a Hackathon)**

*Prepared by: Bijay Niraula (Member GNP/CAN-USA)*

The Internet in general and more specifically various Social Media in particular has impacted on how we interact with others. It has also become a massive force of change around us. The social media is playing a vital role for events such as: providing inspiration to the Arab Spring for regime change, coordination of disaster relief

for Tsunami affected area in Japan, for bringing justice for international criminals like Joseph Kony.

In the same manner, Social Media and the Internet can play a major role in Nepal for impending disasters like a major earthquake. In November 2011, a few members of the Global Nepal Professional Network (GNPN) (also known as CAN-USA) participated in a Hackathon organized by Random Hacks of Kindness (<http://www.rhok.org/>) at the Google complex in the Silicon Valley. Per Wikipedia, “a hackathon (also known as a hack day, hackfest or codefest) is an event in which computer programmers and others in the field of software development, like graphic designers, interface designers and project managers, collaborate intensively on software-related projects.” Inspired and encouraged by that event, GNPN/CAN-USA also decided to hold its own Hackathon. The major goal of the GNPN Hackathon was to brainstorm ideas for assessing technologies that could be used to help Nepal prepare for a major disaster.

Members of the GNPN/CAN-USA from the San Francisco Bay Area and many from other cities around the US/Canada participated in this event. The group brainstormed various ideas and proposed to use a comprehensive open source software for disaster management called Ushahidi (<http://ushahidi.com/>).

**International Diaspora Coordinating with Nepali Counter Parts:** During their visits to Nepal, members of the GNPN/CAN-USA interacted with other parties involved in the Disaster Preparedness. The party included organizations like the US Embassy, ICIMOD, USAID, NSET, CAN-Nepal, American Society of Nepalese Engineers (ASNEng), American Nepal Medical Foundation (ANMF) and also the Nepal Government. During these meetings it was clear that there are many efforts being made in Nepal for disaster preparedness. It was felt that a better system of information sharing and coordination was needed between these organizations. As a result, GNPN/CAN-USA has envisioned a concept of switch board. The switch board would be a coordinating hub, that would through various Application Programming Interfaces (APIs) facilitate exchange of information. During the disaster preparedness period, the hub would act like an information repository.

### Usefulness of a Disaster Preparedness Switchboard:

#### Pre-Disaster :

1. Volunteer management
2. Community training and preparation.

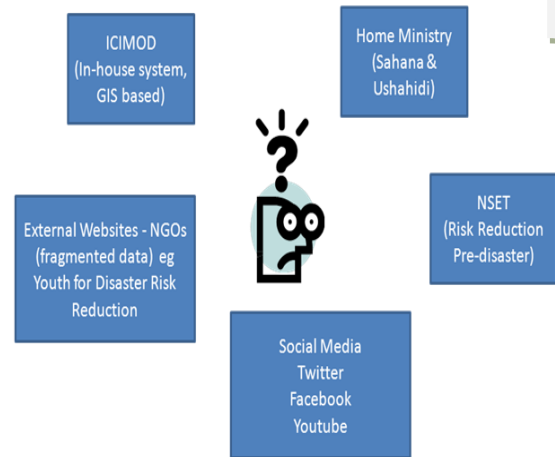
#### During Disaster:

1. First Responders mobilization.
2. Onsite real time information exchange

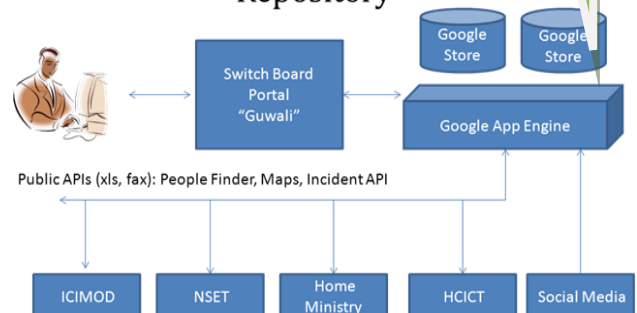
#### Post Disaster:

1. People finder - able to find missing people
2. Damage assessment
3. Volunteer management
4. Resource mobilization.

### Challenge: Multi-portal/Multi-platform Confusion



### Proposed Solution: Centralized Repository



Details of the concept are presented in a Power Point Presentation at this link:

<http://resourcenepal.com/disaster-preparedness-nepal-a-switchboard-concept/>

This web-page also includes minutes of the meeting held with the US Embassy and USAID in Nepal. The concept is still in its early stages. If you would like to be part of the noble cause, please contact members of GNPN/CAN-



USA.

### **2012 Joint ASNEng and CAN-USA Annual Conference; May 26-27**

The American Society of Nepalese Engineers (ASNEng) and Computer Association of Nepal-USA (CAN-USA) held their fifth joint Annual Conference on May 26-27, 2012 in Leesburg, Virginia (Greater Washington, D.C. area), U.S.A. The Greater Washington, D.C. (GWDC) Chapter of ASNEng, the very first chapter of the Society, was proud to host this conference first time. About 160 participants including 110 practicing engineers, scientists, technologists, academicians, and students from private and multinational industries, government agencies, and academia, and 50 accompanying guests attended the conference. The conference drew participants from 15 States in the U.S. (including Arizona, California, Connecticut, Florida, Maryland, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Texas, Virginia, Washington, D.C.), Canada, and Nepal.

The theme of this conference was “*Bringing Engineering, Scientific and Technological Communities Together for a Better World*”. The conference provided an excellent opportunity for the participating engineers, scientists, and related professionals to share their knowledge and experiences on relevant topics, including but not limited to, Earthquake Preparedness and Disaster Relief in Nepal, Energy and Environmental Issues and Concepts, and Recent Advances in Engineering and Science. The conference included four technical sessions with 15 presentations among which three were presented from Nepal via the Skype connection.



Some attendees at the Joint ASNEng/CAN-USA Annual Conference at Leesburg, VA; May 26-27, 2012

The conference kicked off in the morning of Saturday May 26, 2012. Ramesh B. Malla, Ph.D., Conference General Chair and President of ASNEng welcomed the attendees, delivered Conference Opening remarks, highlighted the achievements of ASNEng, and presented

an overview of conference program. Thakur Dhakal, P.E., President Elect/current Vice President, GWDC Chapter of ASNEng and Shashi Dahal, P.E., Chair, Conference Local Organizing Committee gave their warm welcoming address. Following those welcome speeches, His Excellency Shankar Prasad Sharma, Ph.D., Ambassador of Nepal to the United States of America gave a warm welcome remark and recommended all academicians, engineers, scientists and technologists of Nepali Diaspora community to get involved in the projects in Nepal. Conference Technical Chairs Rajendra K. Shrestha, Ph.D., Vice President of ASNEng and Amod Pokharel, Ph.D., Executive Member of CAN-USA highlighted and presented the overview of the technical program. The general opening session was concluded with vote of thanks from Jagannath Ghimire, P.E., Conference Activities/Logistics Chair and General Secretary of ASNEng.

The second and final day (Sunday May 27, 2012) of the conference began with the Annual General Membership Meeting of ASNEng in the morning followed by special professional development presentations from 2 industrial sponsors: Fibwrap Construction Services, Inc. VA and Simpson Strong-Tie Company, OH.

More highlights on the conference will follow in the next issue of the Newsletter. Detail information on the conference can be found on the ASNEng website at <http://www.ASNEng.org>

### **ASNEng Annual General Membership Meeting; May 27, 2012.**

American Society of Nepalese Engineers (ASNEng) held its Annual Membership/Board of Directors meeting under the chairmanship of Society's President, Ramesh B. Malla, Ph.D. at its 5<sup>th</sup> Annual Conference in Leesburg, VA (Greater Washington, D.C. area) on May 27, 2012. Dr. Malla reported on the Society's many activities and accomplishments. The meeting attendees discussed the strategic planning on membership drives, bylaws amendment, scholarships, organization finance, opening of new chapters throughout the U.S., annual conference in 2013, liaison with Nepal, future short and long term activities and plan, and other area of interests. At the meeting, Dr. Malla, announced the proposal received from CAN-USA to hold the 6<sup>th</sup> Joint ASNEng/CAN-USA Annual Conference in 2013 in San Francisco (CA) Bay Area. The meeting attendees discussed and approved the proposal unanimously. Speaking from Atlanta, Georgia via Skype, Prahlad D. Pant, Ph.D. Chair of the ASNEng Nomination/Election Committee announced the election results of the Officers and Directors for the next

2-year (2012-2014) term (See separate article on this.). The meeting attendees also discussed and provided feedback and comments on reports presented by various committees of the Society.

## Other Notable Events

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### Picnic in Greater Washington, D.C.

Nepalese Engineers of Greater Washington DC chapter of ASNEng organized annual reunion and Summer Picnic for 2011 on Saturday, September 24, 2011 at Lake Accotink Park, Springfield, Virginia.

### Picnic in Greater Houston, TX

A gala picnic was organized by the Houston Nepali Engineering and Scientific Community on Saturday, Sept. 24, 2011 in Pavilion 5 of Bear Creek Park in Houston, Texas, U.S.A. with huge success, well attended by about 75 adults, kids and children in nice, warm weather.

Please visit ASNEng website @ [www.asnengr.org](http://www.asnengr.org) for more information on these and future activities.

## Awards & Achievements

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### ASNEng President Edited the ASCE Aerospace Division Earth & Space 2012 Conference Proceedings:

Ramesh B. Malla, Ph.D., President of ASNEng edited (with Kris Zacny, Ph.D. of Honeybee Robotics Spacecraft Mechanisms Corporation and Wieslaw Binienda, Ph.D. of University of Akron) the Proceedings of the 13<sup>th</sup> ASCE Aerospace Division International Conference on Engineering, Science, Construction, and Operations in Challenging Environments (Earth & Space 2012) and 5<sup>th</sup> NASA/ARO/ASCE Workshop on Granular Materials in Space Exploration held at Pasadena, CA, April 15-18, 2012. The proceedings volume is titled “*Earth & Space 2012 – Engineering, Science, Construction and Operations in Challenging Environments*” and is published by American Society of Civil Engineers (ASCE), Reston, VA, April 2012 (ISBN 978-0-7844-1219-0.) The 1600 pages long Conference Proceedings volume contains approximately 165 full-length papers.

### ASNEng Vice President selected as the Editor of the Geophysical Society of Houston

Rajendra K. Shrestha, Ph.D., Vice President, American Society of Nepalese Engineers (ASNEng), has been selected for the “Editor” position in the Geophysical Society of Houston (GSH) Executive Committee Election for 2012-13. Dr. Shrestha will be responsible for bringing out the monthly Geophysical Society of Houston Journal. He has been serving as Assistant Editor for GSH since 2009.

## Chhoto Chinari: Dr. Ramesh B. Malla

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Ramesh B. Malla, Ph.D. is the Founding President of the American Society of Nepalese Engineers (ASNEng) and has been serving on the leadership role of the President of the Society since its establishment in September 2007. He led the effort working with 5 more core group members to establish ASNEng in September 2007. In 2010, he has been re-elected to serve on the ASNEng President’s position for the 2<sup>nd</sup> term.



Born and grown up in Chhoprak village in Gorkha District, Nepal, Dr. Malla attended the local Shree Mandali High School in Chhoprak and passed the Nepal Government’s School Leaving Examination (SLC) in 1971 and was placed in the First Division (among top 70 out of approximately 20, 000 students). He received his Bachelor of Technology degree in Civil Engineering (First Division with Distinction) from the Indian Institute of Technology, Kanpur, India in 1979; M.S. degree in Civil Engineering (with concentration in Structural and Geo Mechanics) from the University of Delaware, Newark, DE, U.S.A. in 1981; and Ph.D. in Civil Engineering (with concentration in Structural and Applied Mechanics) from the University of Massachusetts, Amherst, MA, U.S.A. in 1986.

He worked at United Engineers & Constructors, Inc. in Philadelphia 2 years after his M.S. degree and before starting his Ph.D. program. He joined the Department of Civil Engineering at the University of Connecticut in 1985 as a visiting faculty member and currently holds a tenured position of an Associate Professor. He served as the Associate Head of Department for 8 years. He was one of

the co-founder and the key individual to established the state-wide Connecticut Space Grant College Consortium in Connecticut with funding from NASA in 1991 and served as the Campus Director of his university for the first 9 years.

Dr. Malla was awarded a prestigious position of being a Faculty Fellow at the NASA Lewis Research Center in the summer of 1993 and did research on a portion of the International Space Station structure. He also worked at the Hamilton Standard Space Systems International one semester during his sabbatical leave in 1998.

Dr. Malla's research and teaching experiences are in the areas of applied and solid mechanics, structural analysis, finite element analysis, dynamics and vibration of structures. His research areas encompass structures on Earth, in Space and on the Moon. His research work has been supported by several federal and state agencies and industry, such as the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), U.S. Army, NCHRP-IDEA program of the FHWA/National Academy of Sciences, and many other distinguish agencies. He has authored/co-authored more than 120 technical publications as book chapters, journal and conference papers, reports, and other articles. He has graduated more than 30 M.S. and Ph.D. students from more than 12 countries under his supervision.

Dr. Malla has an exemplary record of serving the engineering/scientific professions and has contributed to the national and international professional societies tremendously. He has received high recognition and prestige in the professional communities. He holds membership in several prestigious professional organizations, including ASCE, ASME, AIAA, AAM, EMI (Charter Member), and SEI and has served on many technical committees, including as the Chairperson of several of them.

He has served in the organizing committees of more than 25 national and international conferences, including the General Chair of two and Technical Chair of another two premier, nationally and internationally prestigious and renowned conferences, e.g. ASCE Earth & Space and AIAA/ASME/ASCE/ASC/AHS Structures, Structural Dynamics and Materials (SDM) conferences. He has organized/chaired/co-chaired more than 40 technical sessions in the conferences.

He served as the Editor of an ASCE special volume, editor of 4 ASCE conference proceedings, the Guest Editor for the ASCE Journal of Aerospace Engineering and an Associate Editor of the AIAA Journal of Spacecraft and Rockets. He has also served on the Editorial Boards of

several prestigious national and international journals and conference proceedings.

Dr. Malla has received numerous honors and recognitions, including the Outstanding Professional Service Award from the Aerospace Division of ASCE.; *Inductee* "Nepalese Hall of Brain" – Nepalese Ireland Society; *Official Citation from General Assembly*, State of Connecticut in Recognition of significant volunteer support to the Connecticut Invention Convention; *NASA/OAI Certification of Recognition* for Research Contribution; University of Connecticut *President's Award* for Promoting Multiculturalism and Affirmative Action; University of Connecticut *Chancellor's Award*, ASCE Student Chapter (Faculty Advisor: R. Malla). and "Mahendra Vidya Bhushan," Gold Medal from the His Majesty the King of Nepal. We are proud to have him as our society's President.

## 3rd Slate of ASNEng Officers and Directors Elected for 2012-2014

Under the ASNEng Nomination/Election Committee (Prahlad D. Pant, Ph.D. (Chair), Sanjay Acharya, Pradeep Gautam, Subash Poudel and Nabin Pudasaini), the election of the Officers and Society Directors of the ASNEng for the next 2-year term (2012-2014) was successfully completed and announced at the General Membership Meeting of the Society on May 27, 2012 held at Holiday Inn, Leesburg, Virginia during its joint annual Conference with Computer Association of Nepal-USA. The 2-year term will begin starting June 27, 2012.

We congratulate all newly elected Officers and Society Directors and wish them great success. The names of the Incoming elected Officers and Society Directors are as below:

### Officers:

- 1). Rajendra K. Shrestha, Ph.D, Houston TX – President
- 2). Jagannath Ghimire, P.E., Baltimore, MD -- Vice President
- 3). Binod Tiwari, Ph.D., Fullerton, CA -- General Secretary
- 4). Janak Thapa, Houston, TX -- Joint Secretary
- 5). Pujan Joshi, Storrs, CT -- Information Secretary
- 6). Samana Ghimire, Sunnyvale, CA -- Treasurer
- 7). Ramesh B. Malla, Ph.D., Storrs, CT – Immediate Past President (Ex-Officio)

### Society Directors:

- 1) Dabit Acharya, Cleveland, OH
- 2). Kul Mani Acharya, Towson, MD
- 3). Sagun Amatya, Richmond, TX
- 4). Baikuntha Adhikari, P.E., Miami, AZ
- 5). Sanjeev Adhikari, Ph.D., Morehead, MI
- 6). Rishi Baral, P.E., Woodbridge, VA
- 7). Binod Basnet, P.E., Lake Worth, FL
- 8). Anju Bhattarai, Ph.D., Carmel, IN
- 9). Rabin Bhattarai, Ph.D., Raleigh, NC
- 10). Santosh Dhakal, P.E., Waldorf, MD
- 11). Bijay Giri, Ph.D., San Antonio, TX
- 12). Pradeep Khanal, Sunnyvale, CA
- 13). Kanhaiya Kayastha, S.E., P.E., La Habra, CA
- 14). Yagna Pant, Elk Grove Village, IL
- 15). Rajendra Khatiwada, Georgetown, KY
- 16). Achyut Shrestha, Tempe, AZ
- 17). Arbina Shrestha, Springfield, VA
- 18). Sagar Onta, P.E., Winnipeg, Manitoba, Canada
- 19). Rajendra Shrestha, Pearland, TX
- 20). Raj K. Tamang, Fairfax, VA
- 21). Ankur Sharma, Rolling Meadows, IL

## Thank You: 2010-2012 Officers and Directors

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We would like to take this opportunity to thank the outgoing Officers and members of the Board of Directors serving during 2010-2012 terms. Thank you for such a deep dedication & hard work and paving the path for us ahead.

### Executive Committee:

*President:* Ramesh B. Malla, Ph.D. (CT)  
*Vice President:* Rajendra K. Shrestha, Ph.D. (TX)  
*General Secretary:* Jagannath Ghimire, P.E. (MD)  
*Joint Secretary:* Pradeep Khanal (CA)  
*Information Secretary:* Pujan Joshi (CT)  
*Treasurer:* Smarika Paudel Sitaula (IL)  
*Members-at-Large:*  
Kul Mani Acharya (MD)  
Sanjaya Gajurel, Ph.D. (OH)  
Upendra Karna, D.Engg., P.E. (NJ)  
Sagar Onta, P.E., (MB, Canada)  
Prakash Shrestha, P.E. (TX)

### Board of Directors:

Ramesh B. Malla, Ph.D. (CT) -- Chair  
Dabit Acharya (OH)

Kul Mani Acharya (MD)  
Ambika P. Adhikari, Dr. Des., AICP. (AZ)  
Rajesh Bajracharya (ON, Canada)  
Rishi Baral, P.E. (VA)  
Yubaraj Budhathoki, P.E. (VA)  
Komal Dutta (IL)  
Sanjaya Gajurel, Ph.D. (OH)  
Jagannath Ghimire, P.E. (MD)  
Samana Ghimire (CA)  
Pujan Joshi (CT)  
Bimal Karki, P.E. (SC)  
Pradeep Karna (AZ)  
Upendra Karna, D.Engg., P.E. (NJ)  
Kanhaiya Kayastha, S.E., P.E. (CA)  
Shyam KC, Ph.D. (D.C.)  
Pradeep Khanal (CA)  
Prakash Khanal (MD)  
Rajendra Khatiwada (KY)  
Naresh Koirala, P.E. (BC, Canada)  
Prakash B Malla, Ph.D. (GA)  
Sagar Onta, P.E., (MB, Canada)  
Bishnu Phuyal, Ph.D. (IL)  
Pratibha C. Phuyal (IL)  
Pranav D. Shah, Ph.D. (NY)  
Manish Shakya (SC)  
Ankur Sharma (IL)  
Shyam Sharma, Ph.D., P.E. (OR)  
Prakash Shrestha, P.E. (TX)  
Rajendra Shrestha, P.E. (FL)  
Rajendra K. Shrestha, Ph.D. (TX)  
Smarika Paudel Sitaula (IL)

## Technical Articles

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### Necessity of Earthquake Preparedness in Nepal

*By Rajendra K. Shrestha, Ph.D.*

It is not possible to prevent earthquakes from occurring, but safety measures intended to mitigate the severity of its effects can save lives and properties. Establishment of the Disaster Preparedness Plan and Disaster Relief Plan has the potential of making a tremendous difference in the earthquake-prone regions, when the catastrophes occur. This is observed in two Latin American countries: Haiti and Chile. By comparing these countries to Nepal and taking a closer look at its current situation, it is evident that Nepal is in need of a solid mitigation plan.

### Haiti and Chile Comparison

Haiti was struck by a 7.0 magnitude earthquake on Jan. 12, 2010 that took more than 230,000 lives and billions of

dollars' worth of properties, and rendered another 1.5 million people homeless. In contrast, Chile was hit by a much more powerful earthquake of magnitude 8.8 and lost over 700 people on Feb. 27, 2010. The Chilean Earthquake was nearly 100 times stronger than the one in Haiti, based on the Richter Magnitude Scale. It is a base-10 logarithmic scale that calculates the amount of energy released by an earthquake. For example, a magnitude 5 earthquake is ten times stronger than a magnitude 4 one.

The stark difference in the impact of earthquakes in these two countries lies in the fact that Chile had an earthquake preparedness plan - Haiti did not. Chile had established a national emergency office. Most buildings in Chile withstood the tremors of the quake; whereas, the buildings in Haiti -- poorly constructed -- were unable to cope with it. The relief efforts in Chile were quick and fast, but it took a much longer time to transport the relief materials to the victims in Haiti.

Unfortunately, Nepal has a situation that is more similar to Haiti than Chile. The building standards in Nepal are very low because the building codes are not strictly followed. On top of that, the infrastructure is inadequate and dwindling, and the disaster preparedness plan in the country is almost non-existent.

### **Nepal's Infrastructure**

In the Kathmandu Valley, approximately 2.5 million people inhabit in poorly constructed buildings situated on a former lake bed. The existing few farm lands are being rapidly replaced by concrete jungles with multi-storey buildings. Kathmandu has only one airport and three roads connecting it to the outside world. In the event of an earthquake, these roads are most likely to be damaged rendering unfit for transportation. Moreover, landslides and avalanches pose a great threat in the mountainous terrain during the earthquakes. To make matters worse, many major cities in Nepal are vulnerable to large earthquakes. The non-profit organization "Geohazards" ranks Kathmandu at the highest risk for earthquake fatalities than any other city in the world.

### **Nepal's Earthquake History**

A 6.5 magnitude earthquake in 1988 struck an area between the Kathmandu Valley in the west and Ilam on the east, killing more than 700 people and damaging thousands of buildings. The Great Earthquake in 1934 of magnitude 8.4 with the epicenter at the Nepal-Bihar (India) border devastated the entire region including the Kathmandu Valley where thousands of people lost their lives and thousands of houses and historical and religious monuments collapsed.

### **Geological Considerations**

From geological consideration, Nepal, occupying the central one-third of the Himalayan Mountain Ranges, sits in a seismically active, or earthquake prone, region. This has to do with the way these mountains were formed over a time span of millions of years.

An earthquake is a vibration of the earth's crust produced by a rapid release of energy caused by a sudden movement along an active fault. A fault is a planar discontinuity in a rock volume across which significant displacement takes place. The planet earth consists of more than a dozen massive tectonic plates that move slower than a snail's pace, i.e., a few centimeters a year, according to the Plate Tectonics Theory. However, these plates can move thousands of miles over a period of millions of years. During the movement along faults, these tectonic plates collide against each other and get deformed, or get separated and rearranged, causing constant transformation on the face of the globe.

The Himalayas originated from the northward movement of the Indian plate and its subsequent collision with the Eurasian plate around 55 million years ago. The Indian plate continues its northward push against the Eurasian plate at an average rate of 56 millimeters per year at present. The crustal shortening and extensive deformation as a result of the plate movement has produced Himalayas, the highest and youngest mountain chain, rising at a rate of 5 millimeters per year, and Tibet, the highest plateau, on earth. The impact of the collision between the Indian and Eurasian plate is felt north of Tibet as far as the Tarim basin in China. Nepal sits right at the boundary of these two huge plates and is part of a geologically and seismically active belt of the Himalayas. Figure 1 exhibits the Indian and Eurasian plate movements.

### **Nepal's Earthquake Risk**

Therefore, the earthquake risk in Nepal is more of a reality than a myth. The seismic activity in an area is determined by the earthquake data collected by the seismological networks. Nepal has a National Seismological Network comprising 23 short period telemetric seismic stations that started with the first seismometer set up at the top of the Phulchoki Hill, 14 km southeast of the city of Kathmandu, in 1978. This network constantly monitors the seismic activities in Nepal and across the globe.

It is one thing to monitor the earthquakes; but to forecast its occurrence is a totally different task, because it is extremely difficult to predict the timing of these quakes. This, in essence, calls for adequate planning for the preparedness and mitigation of the main earthquakes and the aftershocks, and organization of the relief efforts, in



Figure 1. The Indian Plate moves northward and collides with the Eurasian plate over millions of years forming the Himalayan Mountain Ranges (Source: US Geological Survey).

advance. Generally, the main quake is followed by aftershocks of similar or lesser magnitude. These aftershocks are known to bring plenty of panic and misery to the victims already suffering from the main quake.

### Disaster Preparedness Plan

The main aim of this plan is to launch awareness campaign about the earthquake risk and safety tips to mitigate its impact to the general public. This can be achieved through the establishment of Disaster Response Centers and communication with people through meetings, rallies, exhibitions and Web sites. Mobile camps equipped with photos and movies can impart the first-hand knowledge about the earthquakes. Workshops on first aid and CPR procedures can also be conducted in these camps. The informal lectures about steps for earthquake preparedness followed by mock drills with the help of the fire and health department officials will help heighten the awareness about the impending disaster. In addition, the officials from the concerned departments and their staff need to be trained about the ways and means to

handle the earthquake situation.

The implementation of proper seismic design and the earthquake-resistant building codes by the concerned authorities of the Government of Nepal is extremely important to prevent collapse of the buildings so people can safely get out of the houses during the earthquakes.

Adequate measures should also be taken to retrofit the public-service buildings such as hospitals and schools to make them earthquake-resistant. This is going to be a monumental task in which the Nepali diaspora can help by providing the technological and financial assistance as well as the relevant resources.

The National Society for Earthquake Technology (NSET) – Nepal, established as a non-governmental and non-profit organization in 1994, has been actively pursuing the earthquake risk and mitigation planning and earthquake awareness projects. This organization has also been involved in retrofitting school buildings to render them earth-quake resistant. Partnership and joint ventures with NSET and close coordination with the Nepal Government and local municipality authorities can provide a viable approach toward the earthquake preparedness plan.

### Disaster Relief and Recovery Plan

The most urgent need in the aftermath of an earthquake is food, medical care and shelter. During an earthquake, the communication and transportation infrastructure and water supply system are likely to be disintegrated and disrupted. Chalking out a plan for mobilization of these essential elements and equipment as well as repair and restoration of the infrastructure in the event of an earthquake will be very helpful and life-saving. The Disaster Response Center should be adequately equipped with blankets, tents and non-perishable food items.

Earthquake victims most commonly suffer from crushing injuries that can cause kidney damage due to the breakdown of skeletal muscle cells, called "Rhabdomyolysis" in medical terms. Needless to say, first aid on site and transportation of the crushing victims to the medical centers should be a very important part of the relief operation.

### Conclusion

Earthquakes are the most feared natural disaster on earth, yet, no one can foretell when the big one will strike because a lot of uncertainties are involved in its prediction. Since earthquakes are difficult to be predicted, we must be prepared for it by developing and implementing a solid disaster mitigation plan.

In the wake of the 2010 Haitian earthquake, the Nepali

diaspora in the United States has realized the potential of a large earthquake in Nepal any time in the near future, and therefore, is planning to join hands to come up with a blueprint and mobilize the resources for preparedness and mitigation of pre- and post-earthquake events in Nepal. At present, a joint initiative of the American Society of Nepalese Engineers (ASNEng), Computer Association of Nepal-USA (CAN-USA) and America Nepal Medical Foundation (ANMF) is in the process of preparing a position paper on “Earthquake Preparedness and Disaster Relief in Nepal,” which is nearing completion. The author is a member of the steering and editorial committees of this initiative. The author took the opportunity to present an update on the action plan of the committee and outlined the steps need to be taken in planning for the earthquake preparedness/mitigation and relief/recovery operations in Nepal, in a panel discussion on “Earthquake Disaster Preparedness for Nepal” on May 28, 2010, in the 4<sup>th</sup> Non-Resident Nepali (NRN) Regional Conference, Houston, Texas, U.S.A. The author also gave a presentation on “Earthquake Hazards in the Kathmandu Valley: Geological and Geotechnical Considerations” at the 5<sup>th</sup> NRN Global Conference in the Panel Discussion “Role of Nepali Diaspora in Disaster Relief of Nepal” on Oct. 12, 2011 in Kathmandu, Nepal.

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*Rajendra Shrestha, PhD. currently works as Project Engineer at GC Engineering, Inc. He is the Vice President, Member of Board of Directors; and Chair, Bylaws and Membership Standard Committee of American Society of Nepalese Engineers (ASNEng). He can be reached @ rshresthaasneengr@gmail.com*



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*The above article has been previously published in the following journals/online media:*

*Shrestha, R.K. (2010): “Necessity of Earthquake Preparedness in Nepal”, Souvenir, Proceedings of the 4th NRN Regional Conf., Houston, TX, U.S.A., May 28-30, 2010, pp. 31-33*

*NepalNews.Com*

*(<http://www.nepalnews.com/home/index.php/guest-column/7933-necessity-of-earthquake-preparedness-in-nepal.html>), Mercantile Communications, Pvt. Ltd., Kathmandu, Nepal, July 29, 2010*

*The Himalayan Times, International Media Network Nepal (Pvt) Ltd, Kathmandu, Nepal*

*Nepal Vision, Nepalese Association of Houston, Houston, TX, U.S.A., vol. 9. Issue 5, pp. 53-55*

*Laskus, Newah Organization of Nepal, Metropolitan Washington, U.S.A, issue 9, pp. 48-51.*

## **Role of Structural Engineers to Create Earthquake-Resistant Buildings and Infrastructure in Nepal**

*By Kanhaiya Kayastha\*, M.S., S.E. and Ramesh B. Malla<sup>†</sup>, Ph.D.*

### **Introduction**

During the past decades, Nepal has made significant progress in the area of emergency preparedness by providing earthquake awareness programs to general public. Some of the initiatives for combating enormous potential disaster from earthquake hazards include initiation of disaster response plans, development of health sector preparedness and awareness about safety measures in school education programs. On October 11, 2009, the Nepal government approved a National Strategy on Disaster Risk Management. It deals with the mechanisms needed for preparedness, response, and recovery from any disaster. The mechanisms include, but are not limited to providing compensations and rehabilitation to the affected communities and infrastructure impacted by natural disaster.

Every year since 1999, Nepal has also been observing “The Earthquake Safety Day” on January 16<sup>th</sup> by organizing various earthquake awareness programs in Kathmandu, and lately in other parts of the country as well. Its intensions have been to remind people about the catastrophic earthquake of 1934 and the subsequent earthquakes that occurred in various parts of the country. One of the primary objectives of the safety day is to highlight the importance for advance preparation for such disasters.

### **Brief History of Earthquakes in Nepal and Current Assessment**

The 1934 earthquake of magnitude 8.25 in the Richter scale had devastated the entire Kathmandu valley and had caused a huge loss of human lives and properties throughout the country. An earthquake monument at Bhugol Park at New Road, Kathmandu, reminds us of the disaster caused by this earthquake. Lately, the 1980 earthquake of Magnitude 6.5 and the 1988 earthquake of magnitude 6.6 have also caused significant loss of human lives and property throughout the country. These earthquakes have greatly heightened awareness in general public as well as the government authorities, engineers and the scientists from various professional organizations in Nepal. They have also provided meaningful data for authorities in designing various ways and means to save

lives and properties that may be caused by potential earthquakes in future. In 1994, the Ministry of Physical Planning and Works published the first building code in Nepal, titled “Nepal National Building Code.”

According to a recent United Nation’s study, Nepal lies in the 11<sup>th</sup> most earthquake-prone countries in the world. The whole length of Nepal, from east to west, lies in an active shallow earthquake belt. Nepal is also placed in a zone that has the highest probability of risk and the greatest potential of major damage of buildings and infrastructure during an earthquake episode, and is more or less comparable to California. Geologists believe that Kathmandu is built on the soft sediment of a former lakebed. Even historically, it’s said that Kathmandu Valley was at one time a big lake surrounded by the mountains. The geographical topology is thus highly prone to the risks of earthquake.

Kathmandu Valley Earthquake Risk Management Action Plan has estimated that up to 40,000 people could lose their lives and close to 100,000 could get injured if an earthquake similar to that of 1934 were to occur these days. Also, it is estimated that around 60 percent of the houses in the Valley would be severely damaged and many of them beyond repair. In addition, the National Society for Earthquake Technology – Nepal (NSET) established in 1996 to provide the necessary services, including providing training to masons and craftsmen, in the area of earthquake preparedness, risk management plans and general awareness programs. The Geo Hazards International, USA has predicted that 95% of the water pipes and 50% of the pumping stations and treatment plants could also be seriously affected thereby hampering water supplies for several months. Also, half of the bridges and many narrow streets/roads in the Kathmandu Valley could be impassable due to damage and debris. In hilly regions, it is obvious that landslides may occur at various places and transmission towers and telephone lines may collapse blocking the roads. This may make many areas inaccessible, making the rescue and emergency operations a Herculean task. The earthquake disasters are known to trigger fires in the community making the help and rescue operations post-earthquake even more challenging.

### **Learning Lessons from Recent Earthquakes in Haiti and Chile**

The Nepali Diaspora in USA and around the world is very much alarmed from the recent Haitian Earthquake of January 12, 2010 (Magnitude 7.0) and the Chilean Earthquake of February 27, 2010 (Magnitude 8.8). The Haitian earthquake took 200,000 human lives in a population of 20 million; roughly half of the buildings in Haitian capital, Port-au-Prince, were destroyed, and 1

million people became homeless. The island nation must rebuild from ground up. Recent news indicates that the devastation caused by the earthquake in Haiti was worsened by shoddy building construction due to lack of building standards. Haiti did not have a national building code. Engineers and Architects in Port-au-Prince discuss that the first step to rebuilding Haiti would be accompany the setting up of a national building code. Contrary to the Haitian situation, engineers and scientists state that a more or less strict adherence to building codes helped prevent a higher death toll in Chile’s earthquake which was much bigger in magnitude than that of Haiti’s.

### **Building Code for New Construction**

Nepal has had a building code since 1994. However, this code has neither been updated regularly to be in par with the latest developments in the structural design and analysis nor any new recommendations been made about using newer state-of-the-art construction materials. The building code requirements need timely updates to incorporate the experiences gained and the lessons learned in using the codes from previous code-cycle. In USA, the building codes are updated every three years, and currently the International Building Code 2006 is in use. Being located in a highly active earthquake zone, it is vitally important that the building codes are updated regularly. Nepal also needs to follow the general code development process suitable to the nation’s need for earthquake resistant design of building and infrastructure.

The building code normally outlines the necessary minimum design and construction standards that are required to meet the earthquake-resistant building criteria. It is obvious that adhering to the appropriate earthquake resistant building code helps reduce the damage and collapse of buildings. However, it is important to realize that to enhance the greater safety of the building occupants and the general neighborhood from an earthquake, it is essential that along with the adequate building design and construction codes, various other codes dealing with the electrical, plumbing, heating, ventilation and air-conditioning, fire-safety, elevators, stairs, and the exiting and evacuation system requirements are developed and implemented in the development projects.

The building code mandates only the minimum design criteria required to prevent a sudden collapse of the building in the event of a major earthquake. Due to the amount of capital required, it would not be economically feasible to develop the buildings that are fully earthquake-proof. Consequently, the building can have some damages that are easily repairable. By preventing the building from a total collapse, the occupants can easily be evacuated and rescued. However, all essential facilities



including schools and hospitals have to be designed with higher design safety criteria since they are occupied by children and patients respectively, who need special assistance for evacuation and rescue, unlike fully capable adults.

### Code for Retrofitting Existing Buildings

The building code covers only the design of new buildings and does not address the procedures and norms required for retrofitting the existing buildings. Kathmandu Valley is full of old unreinforced-masonry buildings, low and mid-rise in height, built mostly prior to the publication of the 1994 Nepal Building Code. They are therefore vulnerable to significant damages, including total collapse, in the event that a major earthquake hits in the region. This demonstrates an immediate need for developing a separate building code to address the retrofitting design standards and criteria for both the existing historical and non-historical buildings in Nepal. In USA, the Uniform Code for Building Conservation is used in general for such purpose. However, different cities have also developed their own criteria to retrofit the existing buildings in order to make them stronger and prevent them from a complete collapse during earthquakes. The major portion of the existing old buildings in Kathmandu valley and outside the valley were built using simply out of burnt or un-burnt clay bricks laid in mud mortar combined with structural wood members. These types of buildings do not have much lateral-load-resisting abilities to respond to the loads generated by major earthquakes. Depending on the various seismic and geological conditions of the site, these buildings can crumble or collapse, sometimes even in a moderate earthquake. Similarly, in other existing and new buildings, the unreinforced walls would be even more vulnerable to earthquake damage, as is evident from past earthquakes around the world.

### Conclusions

In conclusion, it can be said that to lessen the loss of life and properties, it is vital for an earthquake prone country such as Nepal, to have an adequate earthquake resistant building design codes for constructing new buildings as well as retrofitting and repairing old buildings. It must also be added that it's not only sufficient to make the individual building safe from earthquake disaster, but also the need is paramount to make the full spectrum of infrastructure, such as roads, bridges, airports, telecommunication and electrical towers, water and all utility lines to be earthquake-safe. Nepali Diaspora should come forward to share their knowledge and experience gained internationally with their colleagues in Nepal. In this effort, a joint initiative has been led by three voluntary engineering/scientific/medical organizations -- American Society of Nepalese Engineers

(ASNEng), American-Nepal Medical Foundation (ANMF), and Computer Association of Nepal (CAN)-USA. The joint effort is going to produce a position paper for earthquake preparedness and disaster relief for Nepal.

As of now, sixteen Nepali Diaspora organizations in the U.S including Association of Nepalese in Americas (ANA), Association of Nepalese in Midwest America (ANMA), Nepalese Association in Southeast America (NASEA) and Non-Resident Nepali National Coordination Council (NRN NCC) of USA, and one prominent organization in Nepal - National Society for Earthquake Technology (NSET) - Nepal have committed or have expressed willingness to support this initiative. As the project moves ahead, it is expected that more Nepali Diaspora and other organizations worldwide will come forward to support this worthwhile cause.

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*Kayastha, K. and Malla, R.B.. “Role of Structural Engineers to Create Earthquake-Resistant Buildings and Infrastructure in Nepal”, NepalNews.Com (<http://www.nepalnews.com/main/index.php>), Marcantile Communications, Pvt.LTD, Kathmandu, Nepal, June 06, 2010.*

<http://www.nepalnews.com/main/index.php/component/content/article/13-top-column/6596-role-of-structural-engineers-to-create-earthquake-resistant-buildings-and-infrastructure-in-nepal.html>

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**American Society of Nepalese Engineers (ASNEng)** - a non-profit organization established in September 2007 with IRS 501(c)(3) tax exempt status – aims at providing a common platform for people of Nepalese background and their friends, in engineering and closely related scientific and technical areas to come together, exchange ideas, and support each other for their and the larger society’s common good and benefits. It operates for engineering, scientific and technological research and educational purposes. The Society also strives at promoting engineering, scientific, and technological advancement in Nepal. The Membership application form and detailed information on ASNEng and updates on its recent activities can be found at <http://www.ASNEng.org>.

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