3th Meeting of IASPEI/IAGA/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)

January 15, 2003, PHIVOLCS headquarter, Quezon City, Philippines

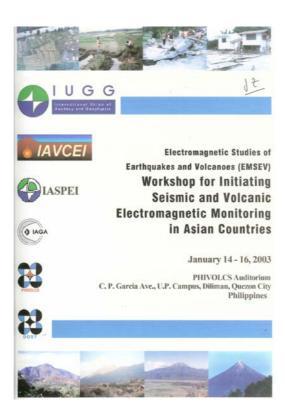
Subject

EMSEV Workshop on Initiating Seismic and Volcanic EM Monitoring in Asian Countries, 13-17 January 2003

Meeting and objectives

The workshop is supported by IUGG and is sponsored by IAGA/IASPEI/IAVSEI Inter-Association Working Group for EM Studies on Earthquakes and Volcanoes. There are 16 international and about 30 Filipino participants in this workshop.

The aim of the WS was to introduce the recent progress in Seismic/Volcanic EM studies to Asian scientists and to discuss the feasibility and possible usefulness of initiating EM monitoring in their countries. The scientific program was worked out by EMSEV Secretariat and LOC chaired by B. Bautista at the Philippine Institute of Volcanology and Seismology (PHIVOLCS).



Organization

IAGA/IASPEI/IAVCEI WORKING GROUP ON ELECTROMAGNETIC STUDIES OF EARTHQUAKES AND VOLCANOES (EMSEV)

Leader: **Prof. Seiya UYEDA** (Japan)
Secretary: **Dr. Toshiyasu Nagao** (Japan)
IAGA Liaison: **Dr. Jacques Zlotnicki** (France)
IAGA WG I-2 Liaison: **Dr. Y. Ogawa** (Japan)

http://yochi.iord.u-tokai.ac.jp/emsev

EMSEV PHILIPPINES WORKSHOP LOCAL ORGANIZING COMMITTEE

Dr. Bartolome C. Bautista

Coordinator

Dr. Jane T. Punongbayan

Assistant Coordinator

Dr. Ma. Leonila P. Bautista, Ms. Mylene M. Villegas, Dr. Rene Solidum, Mr. July Sabit and Mr. Ishmael Narag

Planning Committee

Dr. Jane Punongbayan, Ms. Joan Salcedo, Ms. Myleen E. Carlos, Ms. Vilma Hernandez, Ms. Kathleen Papiona, Engr. Rhommel Grutas and Ms. Imee Guanio Secretariat

Ms. Nanette Melosantos, Mrs. Erlinda Amin, Ms. Joan Salcedo and Ms. Esmeralda Banganan Finance and Food Committee

Ms. Mylene Villegas, Mr. Dindo Javier, Mr. Rene Arante, Mr. Paolo Reniva, Mr. Celestino Saquilon and Mr. Arnold Villar Documentation Committee

Ms. Imee Guanio, Engr. Rhommel Grutas, Engr. Romeo Tabanlar,
Ms. Kathleen Papiona and Mr. Ruel Quijano
Airport Committee

Ms. Kathleen Papiona, Mr. Lito de Guzman, Richard Ballon and Jane Punongbayan
Volume of Abstracts Committee

Ms. Lynn Melosantos, Mr. Julio Sabit, Ms. Imee Guanio, Ms. Hannah Mirabueno, Mr. Allan Loza and Ms. Nanette Melosantos Field Trip Committee

Dr. Rene Solidum, Ms. Lynn P. Melosantos, Mr. Ishmael C. Narag and Ms. Mylene M. Villegas Masters of Ceremonies/Workshop

Foreign Participants

EMSEV WORKSHOP LIST OF NON-FILIPINO PARTICIPANTS/SPEAKERS

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Program

JAN 13, 2003	B Monday Arrival of Participants Icebreaker – Cocktails,	6 pm, PHIVOLCS
JAN 14, 2003	3 Tuesday	
09:00-09:10	Opening Remarks	Usec. Florentino Tesoro OIC-PHIVOLCS
09:15-09:30	Keynote Speech	Comm. Rodolfo Agaton BCGS, NAMRIA
Session 1:		
09:30-09:50	General Seismic/Volcanic EM Phenomena and EMSEV	S. Uyeda
09:50-10:10	Seismicity and Seismotectonics of the Philippines	B. Bautista/J. Punongbayan
10:10-10:30	Volcano Monitoring in the Philippines	J. Sabit
10:30-11:00	Coffee break	
Session 2:		
11:00-11:30	Disaster prevention program of the Philippines	M.L.P. Bautista
11:30-12:00	Electromagnetic Investigations on Volcanoes: What to Observe?	J. Zlotnicki
12:00-12:30	Volcano EM phenomena Observed in Japan	Y. Sasai
12:30-13:30	Lunch	1
Session 3:	Colomo Floririo Dhonomono in DC III F VII F Dongo	T Nomes
13:30-14:00	Seismo-Electric Phenomena in DC-ULF-VLF Range	T. Nagao
14:00-14:30 14:30-15:00	Mid-term EQ Prediction by Geomagnetic Monitoring Seismo-Magnetic Phenomena in ULF Range 1	X. Zeng K. Hattori
15:00-15:30	Coffee break	N. Hallon
15:30-16:00	Seismo-Magnetic Phenomena in ULF Range – Model and Experimental	V. Korepanov
	Evidence	·
16:00-16:30	Discussion	Facilitator
	B Wednesday	
Session 4	Proposed Mechanism of Signal Generation	
08:30-08:50	Piezomagnetic Effect as a Source for Tectonomagnetic Signals: Theory and Observations	Y. Sasai
08:50-09:10	Piezoelectric Effects Associated with Earthquakes	Q. Huang
09:10-09:30	Solid state, Electro-kinetic Mechanisms	M. Kamogawa
09:30-10:00	Discussion	Facilitator
10:00-10:30	Coffee break	T
Session 5:		
10:30-11:00	Transmission Anomaly of EM waves 1	K. Hattori
11:00-11:20	Transmission anomaly of EM waves 2	S. Uyeda
11:20-12:00	Seismo-lonospheric Precursors Discussion	J. Liu <i>Facilitator</i>
12:00-12:30 12:30-13:30	Lunch	Facilitatui
Session 6	LUIICII	
13:30- 13:50	Seismic Risk Predicted from Seismological Observations	Q. Huang
13:50-14:10	Magnetotelluric Studies in Geothermal and Earthquake Epicentral	T. Harinarayana
13.30 14.10	Regions- Past, Present and Future Projects in India- An overview	1. Harmarayana
14:10-14:30	Recent Results of Seismo-Electromagnetic Studies at Agra	B. Singh
14:30-14:50	Title to be announced	Ha Duyen Chau
14:50-15:20	Coffee break	,
15: 20-15:50	Round table discussion on "Feasibility and Usefulness of EM Monitoring"	Rapporteur
15:50-16:30	Reporting	
16:30-	Closing Čeremonies	
-	IURSDAY) FIELD TRIP (Taal Volcano Island, Buco Volcano Observat	ory, Tagaytay Seismic Station)
JAN. 17 (FR	RIDAY) Departure of Participants	

Following the reports on EMSEV (S. Uyeda) and PHIVOLCS activities (Leonila Bautista, J. Sabit), extensive reviews and reports on EM investigation on volcanoes (J. Zlotnicki, Y. Sasai), seismo-electric phenomena in DC-ULF-VLF range (T. Nagao, X. Zeng, K. Hattori, V. Korepanov), anomalous transmission of VLF EM waves (K. Hattori), the Kushida effect in VHF anomalies (S. Uyeda) and ionospheric anomaly (J. Liu) over focal regions, theoretical and experimental investigation on the generation/transmission of EM anomalies possibly related to seismic/volcanic phenomena (Y. Sasai, Q. Huang, M. Kamogawa) were presented with ample time for discussion. Reports from participants on related issues (Q. Huang, T. Harinarayana, B. Singh, D. Widarto, K. Sayanagi) and a video show of the Pinatubo event were also presented.

Lively discussion was made as to what methods may be most effective to meet the specific scientific targets of each countries and some concrete ideas emerged regarding possible monitoring: e. g., for monitoring Taal and Mayon volcanoes, which are the most urgent targets of PHIVOLCS. The structure of these volcanoes should be investigated by EM methods in order to develop efficient monitoring networks based on proton magnetometers as well as electric and EM stations. Another target is the seismicity in the Metro Manila region. For harnessing possible precursory changes of it, a few stations with highly sensitive 3-component magnetometers would be recommendable (Hattori, Nagao and Korepanov) and ionospheric observation by revitalizing the existing ionosonde system would be very cost effective (Liu). EM phenomena before seismic/volcanic events being not yet recognized widely, it was suggested that the investigation may provide a unique opportunity for the Philippines to achieve pioneering contributions.

On the third day, field excursions were made to Taal Vocano and Makban geothermal power plant in two parties, both being highly enlightening. Regarding Taal volcano, Zlotnicki, Sasai and PHILVOLCS teams have discussed the potential researches and monitoring systems to develop to initiate EM studies on this edifice.

Outcome

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MEMORANDUM OF UNDERSTANDING

BETWEEN

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THE IUGG WORKING GROUP ON ELECTROMAGNETIC STUDIES OF EARTHQUAKES AND VOLCANOES (IUGG-EMSEV)

AND

THE PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY-DEPARTMENT OF SCIENCE AND TECHNOLOGY

COVERING

A COLLABORATIVE PROJECT ON:

THE UNDERSTANDING OF THE GEOTECTONICS, SEISMICITY AND VOLCANISM OF THE SOUTHERN LUZON REGION

ARTICLE I. Scope and Objective

The Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV) of the International Union for Geophysics and Geodesy (IUGG), hereinafter referred to as **EMSEV** and the Philippine Institute of Volcanology and Seismology (hereinafter referred to as **PHIVOLCS**) have agreed to enter into this MEMORANDUM OF UNDERSTANDING (hereinafter referred as "**MEMORANDUM**)"

EMSEV Research leaders will consist of Dr. Seiya Uyeda of Tokai University, Japan, Dr. Yoichi Sasai of Tokyo Metropolitan Office, Japan, Dr. Jacques Zlotnicki of Observatoire de Physique du Globe de Clermont-Ferrand, France and Dr. Makoto Harada of Tokai University, Japan. EMSEV will be represented in this MEMORANDUM by Dr. Seiya Uyeda (EMSEV Team Leader) and PHIVOLCS, by its director, Dr. Renato U. Solidum Jr.

The purpose of this **MEMORANDUM** is to establish a framework for scientific and technical cooperation between the **EMSEV** and **PHIVOLCS**, hereinafter referred to as the "**PARTIES**", to further their common goal of studying the tectonically and volcanically active regions in southern Luzon .

ARTICLE II. Cooperative Activities

Cooperative activities under this **MEMORANDUM** shall be in the form of (a) conduct of joint geophysical, geochemical and geological surveys/monitoring; (b) sharing of laboratory/field equipment; (c) sharing and pooling of technical personnel

(d) exchange fel (e) other activiti

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(d) exchange fellowship and scholarships; (e) exchange of technical information; and (e) other activities as mutually agreed upon. All activities shall be subject to applicable laws and regulations of the **Republic of the Philippines** and the **countries** of participating organizations.

ARTICLE III. Source of Funding

Cooperative activities under this **MEMORANDUM** shall be subject to and dependent upon the financial capabilities and manpower available to the **PARTIES**. The activities to be done under this cooperation shall be financed by the **PARTIES** from their respective funds in accordance with a financial plan that must be agreed upon before each activity is initiated.

ARTICLE IV. Data Generation, Management and Proprietorship

In the course of the conduct of this project, a database shall be developed to host the data produced by each study. The resulting data shall be shared among the members of the project for proper analysis and report writing requirement. After the termination of this project, the resulting database shall be the property of both **PARTIES** and can be used by both parties for other research purposes after notifying the other party in writing.

ARTICLE V. Duties and Responsibilities

The EMSEV shall make its best effort to:

- provide survey equipment/monitoring instruments and logistical support in the conduct of the studies;
- 2. provide financial support for the mobilization, operation and maintenance of instruments/equipment while deployed in the field;
- train PHIVOLCS personnel in the proper handling and operation of equipment, data reduction and processing and interpretation of data;
- 4. provide any available data related to the project implementation.
- explore the possibilities of providing trainings and scholarship grants that will develop the necessary PHIVOLCS expertise to make the project sustainable;

PHIVOLCS shall make its best efforts to:

- make the necessary arrangements in the conduct of fieldworks related to the project and provide for personnel and logistical support in the conduct of the same:
- negotiate for sites for the installation of monitoring stations required in any of the studies;

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- 3. provide personnel who will assist in the installation of monitoring instruments and who will later take charge in the maintenance and operation, data retrieval and conduct of preliminary data processing and reduction.
- 4. participate in the final processing and interpretation of all the obtained data;
- provide equipment and transportation support (when available) necessary for the implementation of the project;
- 6. facilitate the acquisition of existing data on the Philippines relevant to the project from local sources;
- 7. provide lodging and office space to visiting scientists of EMSEV at the PHIVOLCS main office while in Quezon City.

ARTICLE VI. Joint Undertaking

The EMSEV and PHIVOLCS agree:

- 1. to pool their resources, expertise and facilities and complement each other, to their best effort, in the implementation of this project.
- 2. to share information relevant to the project such as technical information on the seismotectonics, geodynamics, geochemistry, seismicity, vulcanism and other relevant information necessary for the realization of the objectives of the project;
- to extend assistance and cooperation to one another in the attainment of their common goal.

ARTICLE VII: Authorship

Authorship issues related to any technical paper to be published under this project shall be in accordance with the agreement by all participants to be agreed upon prior to initiation of a specific study.

ARTICLE VIII: Emergency Provisions

It is understood that should PHIVOLCS need its equipment and personnel used in the project for more pressing projects and emergency situations (such as during times of volcanic and seismic crises), said equipment or personnel can be re-deployed at the discretion of the said agency after properly informing **EMSEV**.

ARTICLE IX. Future Revisions or Annexes

At any time during the implementation of this project, the PARTIES have the option to introduce revisions or annexes upon consultation and consent of the two parties.

ARTICLE X. Effectivity

This **MEMORANDUM OF UNDERSTANDING** shall take effect immediately from the date of signing hereof and shall remain in effect for five (5) years or until such time that the objectives of this cooperation shall have been attained through the completion of all approved project areas and activities.

IN WITNESS WHEREOF the Parties have caused their duly authorized representatives to execute this **MEMORANDUM** in English Language.

DR. SEIYA UYEDA

DR. RENATO U. SOLIDUM JR.

Team Leader

Director

EMSEV

PHIVOLCS

SIGNED IN THE PRESENCE OF

Toshiyasu Nagao

Director

Earthquake Prediction Research Center

Tokai University

Document signed in 2004