資　　料

1　終了時評価調査協議議事録（英文）

MINUTES OF DISCUSSIONS
BETWEEN THE JAPANESE EVALUATION TEAM
AND
THE MEXICAN EVALUATION TEAM
ON
THE JAPANESE TECHNICAL COOPERATION
FOR
THE EARTHQUAKE DISASTER PREVENTION PROJECT

The Japanese Evaluation Team (hereinafter referred to as " the Team"), organized by Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Dr. Tsutomu Shimazaki, Deputy Director General, Building Research Institute, Ministry of Construction, visited the United States of Mexico from October 21 to 30, 1996, for the Japanese technical cooperation regarding the Earthquake Disaster Prevention Project (hereinafter referred to as "the Project"), on the basis of the Records of Discussions (hereinafter referred to as "R/D"), signed on March 1, 1990, and on March 23, 1995.

During its stay in the United States of Mexico, the Team exchanged points of view and had a series of discussions about the evaluation of the Project with the Mexican authorities concerned and headed by Dr. Roberto Meli, Director General of the National Disaster Prevention Center (hereinafter referred to as "CENAPRED").

The results of the discussions are written on the document attached hereto.

Both Spanish and English texts of these Minutes of Discussions, as well as the document attached hereto, are equally authentic.

Mexico City, October 29, 1996

Dr. TSUTOMU SHIMAZAKI
Leader
Japanese Evaluation Team
Japan International
Cooperation Agency (JICA)
Japan

Dr. ROBERTO MELI
Director General
National Disaster Prevention
Center (CENAPRED)
Ministry of the Interior
The United States of Mexico

ATTACHED DOCUMENT

I. Summary of Evaluation

This document is an evaluation summary and for details, the attached "Joint Evaluation Report" should be referred.

1. Background of the Project

In September, 1985, the Michoacan Earthquake in Mexico caused significant casualties and damage due to collapse of buildings and other facilities. After the earthquake, a number of damage investigations were conducted by Japanese researchers, engineers and bureaucrats, while various assistance schemes were proposed by Japan. With such an experience, the Government of the United States of Mexico planned "the Establishment of a National Earthquake Disaster Prevention Center" and requested grant aid for the construction of the center and the provision of machinery and equipment, as well as project-type technical cooperation regarding research, training and dissemination activities.

Mexico was not entitled to grant aid at that time, however, it was applied as an exceptional case, taking into consideration the significance of the damage and also the 100th anniversary of the diplomatic relations between Japan and Mexico. Grant aid was followed by the Earthquake Disaster Prevention Project, which started in 1990 and was to continue for 5 years with the purpose of promoting earthquake disaster prevention in Mexico.

2. Achievement of the Project During the Original Period

Although the Project started in April 1990, because of inherent difficulties associated to the implementation of such complex systems, some research and observation activities were not fully conducted at the initial stage. However, with the continuous efforts made by Japanese long-term and short-term experts as well as Mexican counterparts, the testing laboratory and the strong motion observation system started functioning as expected. Consequently, research activities, such as the strong ground motion observation and testing of earthquake-resistant structures were properly implemented. The results have been well recognized by presentations at symposia and in publications by CENAPRED. However, other main activities concerning both training and dissemination were less active compared with research and instrumentation areas.

3. Achievement of the Project During the Extension Period

In November, 1994, a Japanese Evaluation Team visited Mexico in order to jointly evaluate the Project which was to be terminated in March, 1995. As a result of discussions, it became clear that it takes time for a practical application of research results and that training and dissemination activities had just started at that time, although most of the purposes stated in R/D were achieved. The Mexican side, therefore, requested the extension of the Project. Based on the request, a two-year extension of the Project until March 1997 was agreed, focusing on the training and dissemination areas. The main activities during the extension period were to train and disseminate the research results which have been accumulated since the beginning of the Project.

During this period, Japanese long-term experts have focused only on training and disseminating areas while observation of strong ground motion earthquake and research of earthquake

resistant structures were the main focus during the original period. Technical cooperation with regard to the research area was carried out by short-term experts. Japanese financial burden in Mexico has been reduced during this period due to positive contribution by the Mexican side, including proper and sufficient allocation of both staff and budget. Consequently, training and dissemination activities were properly implemented.
With regard to the training activities, DRO Seminars were held two times during the extension period (five times, including the original period) for DRO and the research results by CENAPRED were presented in the seminars. DRO are responsible for the safety of constructions in Mexico. In addition, CENAPRED held the International Seminar of Seismic Safety of Constructions for Central America and the Caribbean Region in order to initiate activities of technical cooperation in this region. The International Seminar on Technologies and Methodologies for Disaster Prevention provided information on earthquake disaster prevention to civil protection administrators.
As part of the dissemination activities, publications such as "Cuadernos de Investigacion" (Research Notes) have been issued and distributed to those institutions concerned in order to introduce the research results by Mexican counterparts and Japanese experts at CENAPRED as well as the Japanese technology. Some videos such as the one on gas pressure welding of reinforcement steel bars in buildings were produced and pamphlets were also issued.

It should be noted that the Popocatepetl Volcano, which is located 70km south-east from Mexico City, became active in December, 1994 and still needs to be watched closely. CENAPRED has been playing the major role in observing the volcanic activities since then and technology transfer by the Project in the field of seismic instrumentation has made a useful contribution to the observation. Although the observation of the volcanic activities is not included in the Project, it is an important indirect impact of the Project.

4. Conclusion

Both Japanese and Mexican sides recognized that the Project purpose was achieved and that the activities and results obtained during the original and extension periods, as well as the cooperation and understanding of those who have been concerned with the Project, both at national and international level, guarantee that the fruits of the Project will sustain towards the future.

II. Others

1. The Mexican side explained the Japanese side a prospect of post-project program whose details are stated in the attached "Future Tasks proposed by CENAPRED".
2.Given the successful results obtained under the Project, CENAPRED has a great interest in maintaining the maximum possible cooperation with JICA and other Japanese agencies for pursuing objectives of common interests.
Technical cooperation would be very welcome in all areas of CENAPRED's activity: research, training and dissemination in the field of seismic, volcanic, hydrometerological and chemical risks. Particularly, there is a strong interest in performing joint activities that could favor the best utilization and upgrading of the great amount of equipment that the Government of Japan has donated to CENAPRED, mainly in the areas of seismic testing and seismic

observation.
CENAPRED's researchers have already established contact with Japanese specialists regarding subjects of common interest for technical cooperation.
Emphasis is placed on technical cooperation aiming at the preparation of guidelines for improving present practice for the seismic safety of buildings.
Additionally, CENAPRED is greatly interested in implementing different joint activities aimed at transferring the technology acquired during the Project to countries of the Central America and Caribbean region.

JOINT EVALUATION REPORT

ON

THE EARTHQUAKE DISASTER

PREVENTION PROJECT

JOINT EVALUATION REPORT : CONTENTS

I. Introduction

1. The Evaluation Teams

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team" organized by Japan International Cooperation Agency (hereinafter referred to as "JICA "), headed by Dr. Tsutomu Shimazaki, visited the United States of Mexico from October 21 to 30, 1996, in order to jointly evaluate with the Mexican Evaluation Team (hereinafter referred to as "the Mexican Team") the achievement of the Japanese technical cooperation for the National Disaster Prevention Project (hereinafter referred to as "the Project") on the basis of the Record of Discussions (hereinafter referred to as "the R/D") signed on March 1, 1990, and on March 23,1995.

2. Members of the Evaluation Teams

2-1. Japanese Team

Dr. Tsutomu Shimazaki	Leader
Mr. Takesi Sugiyama	Technical Cooperation
Mr. Hatsukazu Mizuno	Observation of Strong Ground Motions
Dr. Hideo Fujitani	Earthquake Resistant Structure
Mr. Tomiaki Ito	Planning Evaluation
Mr. Atau Kishinami	Evaluation Arrangement

2-2. Mexican Team

Dr. Roberto Meli	General Director
Dr. Servando de la Cruz Reyna	Research Coordinator
Lic. Gloria Luz Ortiz Espejel	Training Coordinator
Lic. Ricardo Cicero Betancourt	Dissemination Coordinator
M.I. Roberto Quaas Weppen	Instrumentation Coordinator
Lic. Enrique Gutierrez Alcaraz	Institutional Affairs Secretary
Ing. Ricardo de la Barrera Santa Cruz	Technical Secretary
M.I. Lorenzo D. Sanchez Ibarra	Administrative Secretary

3. Methodology for Evaluation

In order to evaluate the past performance and achievement, the following materials were used:

(1) The Record of Discussions (R/D);
(2) The Minutes of Meeting, and other documents agreed upon or accepted during the implementation of the Project;
(3) Hearing from the Japanese experts and Mexican counterparts;
(4) The Project Design Matrix (PDM) ; and
(5) Exchange of view at courtesy calls by the Team
    JICA Mexico Office
    Japanese Embassy
    Ministry of the Interior
    UNAM
    Ministry of Foreign Affairs
    DDF
    DRO Association

II. BACKGROUND AND SUMMARY OF THE PROJECT

1. BACKGROUND OF THE PROJECT

In September 1985, the earthquake in Mexico caused significant damages to the population and urban infrastructure. With such an experience, the Government of the United States of Mexico planned the establishment of earthquake prevention systems, and requested technical cooperation and grant aid for the construction of an earthquake disaster prevention center to the Government of Japan, where experiences and expertise have been accumulated in the field of disaster prevention.

Based on the request, the National Disaster Prevention Center (CENAPRED) was established in March 1990, and both sides signed the R/D, including the Master Plan of the technical cooperation for the Center, within the framework of the Technical Cooperation Agreement signed by the Ministers of Foreign Affairs of the two Nations.

2. Chronological Review of the Project

1987 Jul, Nov-Dec	Dispatch of the Preliminary Survey Team by JICA and identification of the Request from Government of Mexico for the Project. Dispatch of the Preparatory Survey Team
1989 Feb Oct-Nov	Dispatch of the long-term Survey Team Dispatch of the Second long-term Survey Team
1990 Feb-Mar, Mar Apr May	Dispatch of the Implementation Survey Team Signing of the Record of Discussions. Opening of CENAPRED. Start of the Project First Dispatch of long-term experts
1991 Feb-Mar Sep	Dispatch of the Consultation Team Dispatch of Sistine Advisory Team
1992 Nov	Dispatch of the Second Consultation Team
1993 Oct	Dispatch of the Second Visiting Advisory Team
1994 Nov	Dispatch of the Japanese Evaluation Team
1996 Feb Oct-Nov	Dispatch of Mr. KNUT SUMSET for the Economic Cooperation Evaluation Team Dispatch of the Final Evaluation Team

3. Objectives of the Project

The objectives of the Project are to study, develop and systematically improve technology and techniques for earthquake disaster prevention and mitigation, through joint research, training and dissemination activities at CENAPRED, thereby contributing to the development of appropriate prevention measures in Mexico, Central America and the Caribbean Region.

III. PROJECT ACHIEVEMENT

1. Inpute to the Project

1-1. Japanese side

1-1-1. Dispatch of Japanese experts

JICA has dispatched 22 long-term experts and 84 short-term experts. The detail are specified in ANNEX I.

1-1-2. Acceptance of Mexican Counterpart Personnel for Training in Japan

JICA has accepted 23 Mexican counterparts for training in Japan. The details are specified in ANNEX II.

1-1-3. Provision of Machinery and Equipment

By the end of March, 1997, machinery, equipment, and materials equivalent to 217 million yen have been provided by the Japanese Government through JICA. The details are specified in ANNEX III.

1-1-4. Construction of Buildings, Machinery, and Equipment

The building for CENAPRED, machinery and equipment were completed and provided through Japanese Grant aid in July, 1988.

1-1-5. Allocation of Local Cost

JICA has allocated the Local Cost necessary for the project which amounts to about 165 million yen

1-2. Mexican side

1-2-1. Allocation of Mexican Counterparts and Administrative Personnel

The organizational structure and personnel are specified in ANNEX IV.

1-2-2. Purchase and Maintenance of Machinery and Equipment

The Ministry of the Interior considers a special budget for this concepts related with the annual program of Research and Instrumentation activities.

1-2-3. Allocation of Budget for the Project

The Mexican side has allocated the budget necessary for the project in order that it could be implemented in an effective and efficient manner, as specified in ANNEX V.

2. Activities of the Project

2-1. Activity Program (F/Y 1995-F/Y 1996)

The Activity Program from 1990 to March, 1997 are described in the part of each area.

The Activity Program from April, 1995 to March, 1997 are described in the part of each area and there is a summary table as ANNEX VI.

2-2. Research and Instrumentation Departments

2-2-1 SEISMIC INSTRUMENTATION AREA

(1) Achievements during the original period of the project

The main achievements in the Seismic Instrumentation Area are related to the installation, operation and data processing of CENAPRED's seismic observation network. This network has five stations along a line between Acapulco and Mexico City and ten stations in Mexico City. These ten stations have instruments installed on the surface, in down-holes at depths down to 100 m and some within buildings for a total of 38 acceleration measuring points. All of the stations, except three between Mexico City and Acapulco, are linked by telemetry to the central data recording station at CENAPRED.

During the first years of the Project the observation system has been improved by the group in charge of the seismic instrumentation and the participation of Japanese experts. To increase prevent memory, the stations in Mexico City were adapted with remote triggering systems to early start recording an event before the arrival of the seismic waves detected at a distant station. Timing problems were solved for all 15 stations through a new and precise system based on an emulated NHK signal synchronized to a GPS receiver. In addition, the group also worked in the design and development of data recording and acquisition systems, and started a project to develop an early estimation system of seismic intensities for Mexico City.

For the operation of the system, systematic maintenance routines and procedures were developed along the years. These, together with skilled people especially trained here and in Japan, have allowed for a stable operation of the network with very low down time and data loss.

Regarding the strong motion information, data, once gathered from the filed stations, was processed with different software routines especially developed and adapted for the system. All recorded data was published and released immediately after the occurrence of an earthquake, in particular a strong event, for which preliminary seismic reports were prepared. After the information was processed and analyzed in detail, it was published in yearly reports. Also, data was integrated into a strong motion data bank to allow its dissemination and further analysis by other users.

During the five years of the original Project, the network recorded 48 major earthquakes ranging magnitudes from 2.9 up to 7.1, and produced more than 400 accelerograms.

To integrate a mobile observation system for several especial studies in seismology and geotechnical engineering, such as microtremor measurement, seismic zonation and aftershock recording of major earthquakes, a portable broad band recording system of nine seismographs was set up.

(2) Achievement during the extension period of the Project

1) Seismic Observation Networks

As in the previous years of the joint Project, priority has been given to the operation and maintenance of the seismic observation networks, as well as to the processing of earthquake data. Monthly visits to each of the 15 sites were accomplished, which allowed the detection and correction of most instrumental problems. To update and further enhance the network, as well as data quality, new high resolution state-of-the-art accelerographs were received to replace some of the older instruments. Five of these new recorders were installed along the attenuation line between Mexico City and Acapulco. This effort will continue in the following years with the rest of the sites.

A substantial enhancement of the IMP station was performed. A 80m deep down-hole sensor was installed, as well as four additional triaxial sensors within the building. This set of 8 recorders was integrated into a subnetwork with a common remote triggering system, GPS synchronization and a partial telemetry link to CENAPRED.

Eight portable high resolution accelerographs were installed within the structure of the main cathedral, a historical building in Mexico City which is being affected by continuous sinking of the ground. This system will be operated for several months to understand the dynamic response of this structure, and later on it will be used to study other buildings of interest in Mexico City and probably in Acapulco.

The portable network of broad band seismometers received in 1994-95, was thoroughly tested and integrated, solving some initial problems related to the recording system. Intensive use of these instruments has been carried out as part of several research project jointly carried out with other institutions of UNAM.

2) CENAPRED's database on strong ground motion records

Integration of the Mexican Strong Motion Database has almost been completed. This complex system has been established between CENAPRED and the main research institutions (Engineering Institute-UNAM, Federal Electricity Company, CICESE, ICA- Fundation, Instrumentation and Register Center and CENAPRED), which gather accelerographs data in Mexico. It is comprised of three databanks: one for instrumentation and station data, a second one for information about recorded earthquakes, and a third one for acceleration data. The system holds information of 450 strong motion stations, more than 1100 earthquakes recorded in the past 35 years in Mexico and over 7000 triaxial accelerograms, most of which are translated into a unique and standard data format. This huge data set has been published in a three volume catalog and will be soon available on CD-ROM, in this year.

2-2-2 GEOLOGICAL HAZARDS AREA

(1) Achievements during the original period of the project

Among the different activities in the Geological Hazards Area we have the study of the generation mechanisms of great magnitude earthquakes in the Mexican subduction zone of the Pacific Ocean, as well as

the transmission process of seismic waves towards the continent. About this subject, the information of damages produced by great magnitude earthquakes in the last 150 years has been studied. A set of maps showing damage distribution in terms of Mercalli intensities, was formed. It can be examined by users through an interactive program on PC platform.

Attenuation laws have been defined taking as a basis the information provided by the seismic instruments operated by CENAPRED and other institutions. This has been useful to improve seismic risk estimations in different parts of the country.

An essential activity for disaster prevention is the seismic microzonation in the most important cities. In the first stage, attention was concentrated in Mexico City, where the amplification of seismic motion and soil conditions have been clearly identified. Taking this into account, a GIS was developed at CENAPRED showing, among other aspects, the expected seismic intensities in the urban area. The system was transferred to DDF authorities in order to prepare emergency plans. Research activities began with an agreement between CENAPRED and DDF in April, 1993. This work has been presented at several international meetings obtaining a general acceptance. Later on , a similar process was started for Colima City. In that case, detailed information about every building was available as well as recent results of the evaluation of the dynamic characteristics of the urban soil. One of the basic ideas for the development of that system was its applicability to other cities, mainly in those of the States of Jalisco, Colima, Michoacan, Guerrero, Oaxaca and Chiapas.

It is important to mention that the studies on volcanic risk were completed, including computer maps for the San Martin Tuxtla, Ceboruco, Pico de Orizaba, Tres Vírgenes, Colima, Tacana and "Popocatepetl" volcanoes. About the latter, and due to the high level of activities shown during 1994, the Popocatepetl Volcano Planning Committee was formed, including the Civil Protection Units of DF, Puebla, Mexico and Morelos States and authorities of Civil Protection from the "Secretaría de Gobernación" (Ministry of the Interior). Jointly with the Institute of Geophysics of the National Autonomous University of Mexico (UNAM), the networks for seismic monitoring and deformation measurements were designed. In the first step of the installation of the seismic monitoring network, it was possible to receive at CENAPRED the direct signals from four seismographs lent by the Institute of Engineering of UNAM. Also, and in coordination with the University of Colima, the SO_2 content of volcanic emissions was analyzed using its gas spectrometer. A guide and brochures about preventive measures were elaborated and distributed among the members of the " Popocatepetl" Volcano Planning Committee. For this project a budget of one million pesos was accepted by CENAPRED from the "Secretaría de Hacienda y Crédito Público" (Ministry of Treasure).

During this period, the analysis of the response of buildings to seismic motion through accelerographs was started. In this project the amount of results was relatively reduced.

(2) Achievements during the extension period of the Project

1) Broad-band earthquake observation

During 1995, aftershock sequences of two major earthquakes were observed using broad band digital instruments. One of these sequences was observed in the Guerrero Coast after September 14 in the Copala area, very close to the limits with the State of Oaxaca. Also, after October 9, the instruments were deployed in the

Jalisco-Colima coastal area in approximately two weeks. In both cases, very high quality information, in comparison with former campaigns, was obtained allowing us to define the rupture area and focal parameters in great detail.

2) Seismic risk estimation

Data bases and Geographical Information Systems for the Cities of Mexico and Colima have been developed. In the case of Mexico City, the system is complete. For Colima City a more detailed set of maps, including individual information about every building and recent estimations of relative amplification of seismic motion, as well as dominant periods of the soil, are available. However, the vulnerability functions used for risk assessment are under refinement due to new seismic information from the October 9 (Mw 7.9), 1995 earthquake in the Jalisco-Colima coast.

A volume of the *"Cuadernos de Investigación"* series, including results of the microzonation of Colima City, was released in April, 1996. The activities described there to evaluate the dynamic characteristics of the soil, constitute a good basis to be applied to the microzonation of other areas.

Taking into account the high seismic potential along the Guerrero coast, the implementation of maps for the estimation of the seismic risk in Acapulco, on UNIX platform, recently began. The system already includes the main geographical and urban features and geotechnical information.

On the other hand, using broad band seismographs, several aftershocks of the October 9, 1995 event were recorded at Ciudad Guzmán on soft and hard soils, in order to estimate relative amplification factors and dominant periods which can be correlated to microtremor observations and data from a P-S velocity logging study made in the downtown area, where large damages have been reported after great magnitude earthquakes in the past. In 1994 CENAPRED had the assistance of a Japanese Expert named Dr. Kenji Tanaka.

3) Other achievements on seismic data analysis

Several seismic instruments have been installed at a structurally simple building, in the North area of the Mexico City, located in the transition zone according to soil classification. At the same site, borehole and free-field sensors were installed which provide useful information to be used in these studies. Recently, a 6.5 earthquake occurred in the Northwestern part of Guerrero, triggered the instruments; its data is now under analysis. The main purpose in this project is to obtain earthquake-resistant design recommendations which will be published by CENAPRED after conclusive results are obtained.

Studies on the seismic source using broad band seismographs began in may 1995, with the deployment of several instruments along the coast in the Acapulco area. After the September 14, 1995 earthquake, they were moved towards the Copala area. Hence, the information obtained after September 14, 1995 has been mainly used to evaluate source parameters. A joint work with researchers of the Institute of Geophysics will soon be published.

The analysis of the activity of the most active volcanoes in Mexico has continued. However, the "Popocatepetl " still concentrates most of the efforts. Several studies, in collaboration with the Instrumentation Coordination,

have been done, including geodetic measurements, modelling of ash dispersion, quantification of lava flow inside the crater and risks assessment due to mud flows for towns located nearby the volcano.

2-2-3 SEISMIC TESTING AREA

(1) Achievements during the original period of the project

One of the most important activities of the Seismic Testing Area (Structural Engineering and Geotechnical Area, since 1995) was the installation, improvement and starting of equipment in the Large-Scale Structures Testing Laboratory. The most important research program carried out is on the seismic safety of low-cost housing of Mexico and Latin America. The project refers to confined masonry that is the most popular construction method used for this type of buildings. Several series of walls and a 2-story building, all full-scale, were tested in the laboratory. Main seismic behavior characteristics were determined, thus leading to various practical conclusions which have been published and disseminated. The effectiveness of repair and strengthening methods has been assessed. Until 1994, it was necessary to develop and evaluate practical and efficient construction techniques for improving building performance. This was planned to be carried out during the 2-year extension of the Project. This research program has been supported by the *Instituto del Fondo Nacional de la Vivienda para los Trabajadores* (INFONAVIT), which has provided funds for the project and used its results. An agreement between CENAPRED and INFONAVIT was signed in May 1990 on "Coordination of Activities for Developing Programs on Seismic Phenomena and its Effects" whose purpose is to carry out joint programs and studies on earthquakes and its effects on some of the structures of buildings financed by INFONAVIT. Outstanding studies under this agreement are:

- Tests of confined masonry systems under lateral loads (isolated walls with and without horizontal reinforcement, and 3-dimensional specimen -original and repaired-).

- Assessment of Low-Cost Housing in Mexico

The above mentioned agreement was renewed in May, 1994.

Tests for verifying the effectiveness of energy dissipation devices were performed. The computer-controlled testing system of CENAPRED has been used for such experiments. This research was not completed within the original Project duration due to difficulties in mastering the testing technique.

A study to develop a record of some rehabilitated buildings in Mexico City after the 1985 earthquakes, was started in 1993. Information was gathered and processed in 1994. Some typical buildings were selected based on the typical damage and rehabilitation technique observed.

With the cooperation of Japanese experts, samples of main construction materials in Mexico were obtained. Mechanical properties were determined and compared with material standard requirements.

Investigations on soil dynamics are also carried out in this area. Emphasis has been placed on the behavior of Mexico City soils. The dynamic behavior and the effect of cycle repetition on Mexico City soft clays were studied through experiments. A project for instrumenting a building foundation constructed on soft clay

deposits of Mexico City was initiated in 1994. Long-term (static) and dynamic behavior (under earthquakes) will provide valuable information for foundation design on this type of soil for Mexico and other countries. Installation of instruments and initial results were done during the extension of the original Technical Cooperation Project.

Since the beginning of 1993, technical personnel of CENAPRED has been participating in technical working groups for revising and updating the *Normas Oficiales Mexicanas* and *Normas Mexicanas* (material standards). Dr. Meli is the group coordinator. Dr. Sergio M. Alcocer is a member of the *Comité Consultivo Nacional de Normalización de Seguridad y Servicios en la Edificación*; other researchers participate in groups in charge of specific standards (steel bars for concrete reinforcement, structural concrete, masonry pieces, wall panels, prefabricated floor systems, meshes and special reinforcement, etc.).

Personnel of this area participated very actively in conferences, congresses, continuing education courses and other dissemination activities related to seismic safety, either organized by CENAPRED or by other academic centers and professional societies.

(2) Achievements during the extension Period of the Project

1) Tests on confined masonry structures

During the extension period (2 years) of the Project, the main activities in the Structural Engineering and Geotechnical Area (formerly called Seismic Testing Area) were on the project of seismic safety of low-cost housing. Ten lateral-load tests were carried out in confined masonry and reinforced concrete full-scale isolated walls. Effectiveness and construction of welded wire meshes as a reinforcing technique for masonry walls were assessed; a reinforced concrete wall was used for comparison. Experiments were also conducted on walls, made of industrialized extruded hollow clay bricks. Different horizontal reinforcement ratios were studied. Technical reports on a 3-dimensional two-story building (original and repaired), the use of steel meshes and tests of extruded bricks were finalized.

2) Techniques on computer on-line tests

Software problems arose in 1994, were solved. System calibration for 50-ton and 100-ton actuators was done. Experiments aimed at studying three types of energy dissipation devices were performed. Different variables in specimen design were used and tested. Static computer-controlled tests and pseudo-dynamic tests were carried out. Technical reports with data analysis and conclusion were produced. Experiments will continue next year. A viscous damper device was tested and evaluated. The total automatization of the tests are in process.

3) Research on seismic strengthening and rehabilitation

The first phase of the record of some buildings rehabilitated after the 1985 earthquakes was completed, and the final report was finalized. Some structures were selected for further study based on their simple structural system layout and typical rehabilitation scheme. Evaluation of the seismic safety of some of the selected structures was performed. This activity will continue in next years; monitoring of buildings response will be pennanent.

The publication of the following "Cuademos de Investigación" named:

- Code and comments about the evaluation of the seismic resistance in concrete existing buildings.
- Guide for the seismic design in concrete existing buildings.
- Manual for the application of the code for the evaluation of the seismic resistance and the guide for the seismic design in concrete existing buildings,

will be an important contribution in the fields above mentioned.

4) Research on the seismic behavior of buildings

A building was identified for installing the portable acceleration transducer system of this area. The system will be installed in 1997.

In 1994, a project aimed at studying the static and dynamic behavior of building foundations in Mexico City, was undertaken. Due to the difficulty in finding a suitable structure, it was decided to instrument the foundation of one of the supports of the *Impulsora* bridge. The foundation consists of a compensated box - friction pile system similar to those employed in medium-rise and high-rise buildings located on the soft soil area of Mexico City. The bridge is located in the Northern part of the city and crosses above the *Metropolitano B* subway line. The bridge superstructure was also instrumented. Characteristics of the instrumentation and first results are included in the technical reports published.

5) Building standards for evaluating damaged buildings

Buildings standards for evaluating damaged buildings and guidelines for the rehabilitation of wood and reinforced concrete structures of Japan were translated into Spanish, revised and published in the " *Cuadernos de Investigación"* series. Books are being distributed among interested professionals.

The publication of the "Cuadernos de Investigación" named:

- Code for the evaluation of damage in reinforced concrete buildings.
- Code for the evaluation of damage in wood structures,

will be an important contribution in the above field.

6) Other achievements (technical transfer in the gas and pressure welding area)

A 2-week course on gas and pressure welding technique was given to eight experienced welders and technicians on non-destructive testing. The course consisted of lectures and practical training. A final examination was applied at the end. A research project aimed at verifying the suitability of Mexican rebars for gas and pressure welding, and determining the acceptance criterion for ultra-sonic non-destructive inspection technique was started.

2-3. TRAINING DEPARTMENT

(1) ACHIEVEMENTS DURING THE ORIGINAL PERIOD OF THE PROJECT

According to the content of CENAPRED's creation Decree concerning training activities, these were mainly guided to civil protection training. As of 1993, the Training Area also started to promote and support the training of Mexican technicians and professionals with the participation of the Research Area.

Until mid-1994 the Training Departament consisted of two main areas: the Civil Protection Training area and the External Radiological Emergency Plan (PERE) Training Area for the Nucleoelectric Plant called "Laguna Verde". In this date, the Technical Training Area was established.

From 1993, aspects on technical training for professionals from the construction area began to be considered, at the National and International levels, to fulfill the objectives of the Project aimed at carrying out combined activities of training support to the Research Area and external institutions (Such as the Training Institute of the Building Industry, ICIC).

In 1993, the need of carrying out a seminar on Earthquake Disaster Prevention in Mexico was detected. Then, the Japanese Team carried out, with the support of the Training Area, a documented and field investigation to work in the following aspects:

- To gather information of courses and seminars on seismic engineering and professional updating offered by several institutions and organizations in Mexico City for civil engineers and other related professionals in the design and construction processes; and,
- To diagnose the current state of the earthquake-resistant practice on the design and construction of buildings.

With this information, the contents of the courses and seminars offered were analyzed; also, their coverage and reach were identified. On the other hand, the fact that changes in the construction regulation after the 1985 earthquake, sought to give more attention not only to the design process, but also to supervision and quality control of the construction works and materials was considered. Then, with the 1987 edition of the of construction regulation, the figure of the *"Director Responsible for Works (D.R.O.)"* was created as a professional who takes responsibility of the quality control and the structural safety of the constructions, amoung other aspects.

According to the above-mentioned concepts, it was recommended that the courses on seismic engineering, structural safety and disaster prevention to improve and/or up-date related knowledge should be addressed to the Directors Responsible for Works, and, in a second stage, to the Supervisors of Works, since they are also related to the quality control of materials and construction works, therefore, they also need to identify the main aspects to provide the constructions with an adequate seismic safety level.

At the end of 1993, the 1st.. National Course for Works Supervisors was carried out under the title: ***"Quality in Design, Construction and Supervision of Constructions"***, and during 1994, we was carried out the 1st. and 2nd. Courses on ***"Seismic Safety of Constructions for Directors Responsible Works"*** (Table 3). In both cases, an important support from the Japanese Team at CENAPRED for carrying out these courses, was obtained.

Internationally, the Training Area and the Japanese Team carried out a project to know the specific training needs of countries from Central America in the areas of Seismology and Seismic Engineering. The first stage

- Code and comments about the evaluation of the seismic resistance in concrete existing buildings.
- Guide for the seismic design in concrete existing buildings.
- Manual for the application of the code for the evaluation of the seismic resistance and the guide for the seismic design in concrete existing buildings,

will be an important contribution in the fields above mentioned.

4) Research on the seismic behavior of buildings

A building was identified for installing the portable acceleration transducer system of this area. The system will be installed in 1997.

In 1994, a project aimed at studying the static and dynamic behavior of building foundations in Mexico City, was undertaken. Due to the difficulty in finding a suitable structure, it was decided to instrument the foundation of one of the supports of the *Impulsora* bridge. The foundation consists of a compensated box - friction pile system similar to those employed in medium-rise and high-rise buildings located on the soft soil area of Mexico City. The bridge is located in the Northern part of the city and crosses above the *Metropolitano B* subway line. The bridge superstructure was also instrumented. Characteristics of the instrumentation and first results are included in the technical reports published.

5) Building standards for evaluating damaged buildings

Buildings standards for evaluating damaged buildings and guidelines for the rehabilitation of wood and reinforced concrete structures of Japan were translated into Spanish, revised and published in the " *Cuadernos de Investigación*" series. Books are being distributed among interested professionals.

The publication of the "Cuadernos de Investigación" named:

- Code for the evaluation of damage in reinforced concrete buildings.
- Code for the evaluation of damage in wood structures,

will be an important contribution in the above field.

6) Other achievements (technical transfer in the gas and pressure welding area)

A 2-week course on gas and pressure welding technique was given to eight experienced welders and technicians on non-destructive testing. The course consisted of lectures and practical training. A final examination was applied at the end. A research project aimed at verifying the suitability of Mexican rebars for gas and pressure welding, and determining the acceptance criterion for ultra-sonic non-destructive inspection technique was started.

2-3. TRAINING DEPARTMENT

(1) ACHIEVEMENTS DURING THE ORIGINAL PERIOD OF THE PROJECT

According to the content of CENAPRED's creation Decree concerning training activities, these were mainly guided to civil protection training. As of 1993, the Training Area also started to promote and support the training of Mexican technicians and professionals with the participation of the Research Area.

Until mid-1994 the Training Departament consisted of two main areas: the Civil Protection Training area and the External Radiological Emergency Plan (PERE) Training Area for the Nucleoelectric Plant called "Laguna Verde". In this date, the Technical Training Area was established.

From 1993, aspects on technical training for professionals from the construction area began to be considered, at the National and International levels, to fulfill the objectives of the Project aimed at carrying out combined activities of training support to the Research Area and external institutions (Such as the Training Institute of the Building Industry, ICIC).

In 1993, the need of carrying out a seminar on Earthquake Disaster Prevention in Mexico was detected. Then, the Japanese Team carried out, with the support of the Training Area, a documented and field investigation to work in the following aspects:

- To gather information of courses and seminars on seismic engineering and professional updating offered by several institutions and organizations in Mexico City for civil engineers and other related professionals in the design and construction processes; and,
- To diagnose the current state of the earthquake-resistant practice on the design and construction of buildings.

With this information, the contents of the courses and seminars offered were analyzed; also, their coverage and reach were identified. On the other hand, the fact that changes in the construction regulation after the 1985 earthquake, sought to give more attention not only to the design process, but also to supervision and quality control of the construction works and materials was considered. Then, with the 1987 edition of the of construction regulation, the figure of the *"Director Responsible for Works (D.R.O.)"* was created as a professional who takes responsibility of the quality control and the structural safety of the constructions, amoung other aspects.

According to the above-mentioned concepts, it was recommended that the courses on seismic engineering, structural safety and disaster prevention to improve and/or up-date related knowledge should be addressed to the Directors Responsible for Works, and, in a second stage, to the Supervisors of Works, since they are also related to the quality control of materials and construction works, therefore, they also need to identify the main aspects to provide the constructions with an adequate seismic safety level.

At the end of 1993, the 1st. National Course for Works Supervisors was carried out under the title: *"Quality in Design, Construction and Supervision of Constructions"*, and during 1994, we was carried out the 1st. and 2nd. Courses on *"Seismic Safety of Constructions for Directors Responsible Works"* (Table 3). In both cases, an important support from the Japanese Team at CENAPRED for carrying out these courses, was obtained.

Internationally, the Training Area and the Japanese Team carried out a project to know the specific training needs of countries from Central America in the areas of Seismology and Seismic Engineering. The first stage was to verify the technological level reached in these areas. Specifically, technical visits to El Salvador, Guatemala, Honduras and Costa Rica, were carried out. In a second stage of the project, the information was analyzed and a report on the detected needs was made. The third stage of this project, which would imply the integration of subjects and the elaboration of didactic materials wich are necessary for the formal establishment of a course, began in the second semester of 1994.

(2) ACHIEVEMENTS DURING THE EXTENSION PERIOD OF THE PROJECT

1) Technical Training Courses

a) Course on Seismic Safety of Constructions for D.R.W.s

The establishment of programs on technical training was promoted during this period, with a special attention to earthquake disaster prevention for those professionals in charge of designing and constructing buildings by means of their updating in the seismic engineering and seismology fields. The most important effort in this way, is the carrying out of other 4 courses on Seismic Safety of Constructions for D.R.W.s (Table 3). Fortunately, these courses have had very positive results, and also an important support in terms of budget assignment given by the Japanese Team, and it is hoped that it will be permanent to achieve a larger national coverage with the main purpose of unifying approaches in the earthquake-resistant design and construction practice, mainly in those states of the country which have a high seismic risk level.

The course is based on the following subjects which are developed in a period of 35 hours.
A. Seismology and seismic hazard
B. Basic knowledge on seismic design of buildings
C. Specific knowledge on earthquake-resistant design and construction
D. The practice of earthquake-resistant construction and quality control in other countries
Discussion Panel: The role of the D.R.W. in structural safety

On the other hand, at the beginning of 1995 CENAPRED carried out, with its own resources, a Course on Seismic Safety of Constructions in Manzanillo, Colima, in response to the request by of authorities and professionals of this region after the occurrence of the October earthquake in that place.

Table 1. Courses of Seismic Safety of Constructions

Curso	Carried out by:	Date	Participants			Total
			D. F.	Interior	Foreign	
DRO-1	JICA and CENAPRED	Feb.	43	10	--	53
DRO-2	JICA and CENAPRED	1994	40	11	--	51
DRO-3	JICA and CENAPRED	Nov. 1994	56	18	2	76
DRO-4	JICA and CENAPRED	Jun.	48	10	--	58
Manzanillo, Col.	CENAPRED and Gov. of the St.	1995	--	40	--	40
Nicaragua	CENAPRED	Nov. 1995	--	--	45	45
DRO-5	JICA and CENAPRED	Feb. 1996	61	17	--	78
DRO-6 International	JICA, CENAPRED and S.R.E	Mar. 1996 Jun. 1996 Oct. 1996	25	10	12	47
		Total:	273	116	59	448

Notes:

1. Participants from 12 different States of Mexico attended the course.
2. Foreign participants from countries of Central America and the Caribbean Region
3. The 273 trained Directors Responsible for Works represent a 19% of the total number of D.R.W. in Mexico City.

b) International course of Seismic Safety of Constructions for Central America and the Caribbean Region

As mentioned previously, the Center has a strong intention to institute of technical training programs in third countries, specifically in Central America and the Caribbean Region in order to improving the design and construction practice in high seismic risk zones, and to propose, if necessary, uniform approaches to develop or update building codes. In that regard, the Training Area obtained an important experience in Nicaragua and Costa Rica because of the carrying out of courses on Seismic Safety of Constructions and Civil Protection, by the Center itself.

Considering the information obtained from visits to Central America, which were described in the previous chapter, a report that shows the main needs of technical training in those countries was elaborated. Therefore, the thematic contents were designed and all the necessary preparations were made to carry out the *"1st. International Course of Seismic Safety of Constructions for Central America and the Caribbean Region"*. The main support for the course was given by JICA, CENAPRED and the Ministry of Foreing Relations (S.R.E.). The S.R.E. carried out an important dissemination of the course in several countries.

2) Gas and Pressure Welding Training Courses (GPW).

In 1993, the Gas and Pressure Welding technique, used to join steel bars for the reinforcement of concrete structures, was presented in CENAPRED by a Japanese short-term expert. At the same time, JICA donated to CENAPRED a set of welding equipment, as well as Japanese standards and specifications on this technique, and on the ultrasonic inspection. Because of the great interest generated in Mexico, in 1994 and

1995 the Spanish translation of texts on GPW and its inspection, as well as the edition of related videos, were made with the participation of a committee integrated by the Training, Research and Dissemination Areas.

In 1995 a project to evaluate the technique started, the first stage included the training of a group of Mexican technicians in GPW, and its inspection by ultrasonic means. The training course included theory and practice, and was given by two Japanese short-term experts to 8 technicians. At the end of the course, the participants were evaluated. The results showed satisfactory training of participants in the welding process execution. However, the training was insufficient to achieve appropriate weld inspections with ultrasonic apparatus. On the other hand, it was found that the Japanese standards for weld inspection are not fully applicable to the Mexican steel bars. Therefore, and in order to achieve a complete transference of the technique, it is necessary to solve the following points:

1.- To develop a research program in order to establish the acceptance and rejection approaches for the GPW by means of ultrasonic inspection, using the characteristics of Mexican steel.

2.- To form a Mexican group of instructors for GPW and ultrasonic inspection, to support the tasks of training in future courses (It is desirable that the instructors belong to CENAPRED or ICIC-type institutions).

In July, 1996, an equipment for ultrasonic inspection was donated to CENAPRED by JICA. With this donation, the Center completed all the necessary tools to execute and inspect the GPW. However, the ultrasonic training of Mexican technicians remains pendent since CENAPRED does not have any person who satisfactorily operates the equipment. Therefore, the establishment of courses of GPW in Mexico depends on the solution of these aspects.

2-4. DISSEMINATION DEPARTMENT

(1) ACHIEVEMENTS DURING THE ORIGINAL PERIOD OF THE PROJECT

Dissemination activities developed by CENAPRED during the Technical Cooperation stage, were based on Sections III and IV, Article 3rd of its Creation Decree, which state, among other responsibilities, "to integrate an information and documentation compilation that enables competent authorities and institutions to research, study and analyze the specific branches and aspects of disaster prevention, as well as to disseminate related results among authorities and the people at large, through publications and academic events". In that regard, the Dissemination area carried out its activities -since 1990- in the following manner:

A) Planning and carrying out of meetings and academic events (seminars, conferences, workshops, etc.), in order to promote the exchange of knowledge among experts related -above all- to earthquake phenomena, as well as the necessary transference of technologies and experiences, with the particular participation of Japanese and Mexican experts.

In that regard, about 214 events were carried out, including some jointly celebrated with the Japanese Team such as the ones below-underlined:

- International Symposium on Seismic Safety for Low-cost Housing.

- Symposium on Seismic Instrumentation of Strong Ground Motions.
- National Workshop: Present and Future of Experimental Research on Structures in Mexico, Japan and USA.
- International Symposium on Earthquake Disaster Prevention.
- International Seminar: Recent Research on Earthquake Risk Mitigation in Japan and Mexico.
- 1st Course on Seismic Safety of Constructions for Directors Responsible for Works.
- 2nd Course on Seismic Safety of Constructions for Directors Responsible for Works.

It is suitable to point out that for carrying out such events, the Dissemination Area participated in their planning, implementation and logistics support. The following table shows the number of events supported by this Area:

DESCRIPTION	1990	1991	1992	1993	1994	1995 Mar.	TOTAL
Symposium, congresses, courses, workshops, etc., jointly organized with JICA and/or the Japanese Team at CENAPRED.	1	5	3	6	2	-	17

B) Design, publication and distribution of information related to the activities of CENAPRED and the National Civil Protection System (SINAPROC). The publications edited by CENAPRED are addressed to three specially identified sectors of the population:

1) To the people at large: material containing measures on what to do before, during and after a disaster.

2) To the people responsible for operating SINAPROC and others interested in deepening into disaster prevention subjects: technical, normative and methodological documents, as well as publications to disseminate the specific knowledge of Civil Protection.

3) To the scientific and academic community: results of the research carried out at CENAPRED and/or at other realted institutions, including technical information such as studies, specific research on phenomena, their generating mechanisms and other specifications.

In addition, the works of CENAPRED were published as congress proceedings and in national and international technical newsletters. On the other hand, several publications were produced as a result of the events organized by CENAPRED (congresses, symposia, workshops and courses).

The following table shows the list of publications jointly edited with the Japanese Team:

NAME OF THE PUBLICATION	
Proceedings "International Symposium on Seismic Safety in Low-cost Housing"	500
Proceedings "Symposium on Seismic Instrumentation of Strong Ground Motions"	300
Proceedings "National Workshop: Present and Future of Experimental Research on Structures in Mexico, Japan, USA and Canada.	300
Abstract "International Symposium on Earthquake Disaster Prevention"	300
Proceedings "International Symposium on Earthquake Disaster Prevention"	300
12 "Cuadernos de Investigación"	400 each
Proceedings "1st Course on Seismic Safety of Constructions for Directors Responsible for Works"	300
Proceedings "2nd Course on Seismic Safety of Constructions for Directors Responsible for Works"	300

C) Integration of a specialized information heap -emphasizing the exchange of information- to support and encourage the development of research, training and dissemination activities; the above-mentioned exchange is carried out at the national and international levels. Until 1995, the information heap included 6454 publications, in addition to 143 different videos. In that regard, it is appropriate to point out that the Library (Documentation Unit) currently updating its computer systems for gathering a larger number of publications.

1) Publications, addressees and exchanges

The Dissemination Department has had an active participation since the opening of the Center, which can be demonstrated with the large number of publications it has edited (Annex VII), being outstanding the results of research works carried out at CENAPRED, which are translated into Technical Reports and presented in an economic edition of 50 to 100 copies only. When these works require a larger distribution for the importance of their content, then they are translated into "Cuadernos de Investigación" (Research Books) with an edition of 400 copies each, and distributed among libraries of research centers, professional associations and other people interested in such works.

Additionaly, it has been possible to identify the information needs of the State Civil Protection Units of the Mexican Republic, according to the different types of phenomenon to which their locations are exposed to. Thus, the Dissemination Department makes the necessary efforts to provide the above-mentioned Unites with updated information, without excluding the information obtained by the Center through the systematic exchange with other related or complementary institutions. This information is distributed at the national forums where these organisms meet, such as symposia, workshops, seminars, etc. -being one of the most important events the annual celebration of the National Week for the Civil Protection Culture-, in addition to responding to the different requests of information they make to CENAPRED all the year.

As an example, it is suitable to mention this year's distribution, which individually represented an average sending of 800 printed and video materials for every State, including videos, fascicles, magazines, practical guides and posters, which are reproduced by each State in order to reach the most remote towns at the Municipal Level.

With the purpose of exchanging information to support and encourage the activities of the Center, up to date several national and international organisms, research centers and other related entities have been contacted (National and International), which receive the publications edited by CENAPRED, depending on their characteristics and functions.

2) Mexico-Japan Dissemination Sub-Committee

The "Cuadernos de Investigación" series was strengthened, through which the research works - principally the joint research works- are disseminated. For this purpose, a sub-program was included with the following action lines:

- To define contents of interest and to establish a program for the publications agreed.

DESCRIPTION	1995 Apr.	1996	TOTAL
Symposia, congresses, courses, workshops, etc., jointly organized with JICA and/or the Japanese Team at CENAPRED.	5	2	7
At the International Level (These figures are included in events mentioned in former divisions.)	-	2	2

2-5. Further Input in the Remaining Period of the Project

Both teams agreed to provide all the provision as agreed upon in the R/D.

IV. RESULT OF EVALUATION

1. Achievement of the Implementation Plan

As specified in ANNEX VIII.

2. Summary of the evaluation Results

2-1. Effectiveness

Research Area
The continuous effort by both Japanese experts and Mexican counterparts has produced internationally recognized investigation results in the field of seismic safety on confined masonry structures and pseudo-dynamic on-line tests. Various testing laboratories and networks of strong ground motion observation provided by Japanese grant aid and project-type technical cooperation are fully utilized.

Training Area
Training, as well as dissemination, of the research results, which are the main activities during the extension period, have been conducted by Japanese long-term experts. With regard to training activities, DRO Seminars, International Seminar on Seismic Safety of Constructions for Central America and the Caribbean Region and earthquake disaster prevention seminar were held. Hearing from those people concerned and questionnaires for the participants show that the seminars were well received in Mexico and abroad. They are now held only by the Mexican side.

Dissemination Area
Concerning dissemination area, research results by the project-type technical cooperation as well as Japanese technology were introduced in such reports as "Cuaderno de Investigacion". Those reports were widely distributed among those concerned. In addition, videos and posters were produced for further research results dissemination.

2-2. Impact

a. Demand for DRO Seminar for Director Responsible for Works is high because of its practical content. The seminar gives DRO's the skill for application of research results to the practice. The research by CENAPRED have been widely disseminated among those people concerned in Central America and Caribbean Region.
b. With the improvement in the research level, CENAPRED researchers have presented the results of their researches and also played an essential role in the Code Committee, as an effort to realize the dissemination and practical application of research.
c. CENAPRED has conducted some researches for private companies and other institutions.
d. The issue of "Cuaderno de Investigacion", pamphlets and videos has contributed to an improvement in skills of those people concerned in Mexico and abroad. Consequently the importance of earthquake disaster prevention has been well recognized through their disseminating activities..

2-3. Efficiency

The transfer from grant aid to project-type technical cooperation was carefully planned from the inception of the Project. The provision of grant aid, including CENAPRED building and the main machinery and equipment (large scale structure testing facilities, soil mechanics testing equipment, seismic observation network, training equipment, etc.) was smoothly followed by the project-type technical cooperation.
Input by Japanese side (Dispatch of experts, provision of machinery and equipment, acceptance of Mexican counterparts) and input by Mexican side (allocation of counterparts and budget), were implemented as planned without the influence of the economic crisis in Mexico.

2-4. Rationale

CENAPRED has conducted research, training and dissemination activities regarding earthquake disaster prevention technology and functioned as a major supporting organization of disaster prevention and relief, since the beginning of "the National Civil Protection System". It has also contributed to the promotion of earthquake disaster prevention in Mexico. Thus the Project is deemed as rationale.

2-5. Sustainability

2-5-1. Institutional Sustainability

With regard to earthquake disaster prevention area, CENAPRED was established as the technology supporting organization based on "the National Civil Protection System" set in 1986. The importance of this area will be recognized among the Mexican government and people.
CENAPRED has been in apposition with the Civil Protection Direction of Ministry of the Interior and institutionally stable. Therefore, it is supposed to be capable of managing itself.
Concerning the research staff, 43 academic staff have been allocated from the Ministry of the Interior. An improvement in wage level has contributed to the promotion of CENAPRED activities toward the future.
Research sponsorship from private companies and joint research with other institutions such as UNAM will continue.

2-5-2. Financial Sustainability

CENAPRED has been expected to function as a national earthquake disaster prevention organization since the importance and the need of disaster prevention including earthquake disaster prevention is being well recognized. For this reason, it has had a budgetary priority and a certain level of budget will continue to be secured.

2-5-3. Technical Sustainability

As results of the research activities, high-level outputs in the field of earthquake resistant technology in confined masonry structures, techniques on computer on-line tests and strong motion earthquake observation have been obtained. They have been introduced in seminars and reports and disseminated

among those who are concerned in Mexico and abroad. The influence is extensive and continuous activities are expected.
Maintenance of machinery and equipment provided by grant aid and project-type technical cooperation is good. However, budget allocation should be secured for renewal of equipment and purchase of spare parts in the future.

V. CONCLUSION

Both Japanese and Mexican sides recognized that the Project purpose was achieved and that the activities and results obtained during the original and extension periods, as well as the cooperation and understanding of those who have been concerned with the Project, both at national and international level, guarantee that the fruits of the Project will sustain towards the future.

- To disseminate, present and perform an editorial plan for each publication.
- To elaborate a directory with the exact number of national and international addressees to whom publications are sent to.

Within the Documentation Unit, systems for selecting specialized materials were improved, consolidating the integration of the bibliographic heap. A greater impulse was given to the exchange with other related or complementary organisms, both at the national and international levels, principally in Central America and the Caribbean Region. In 1995, the installation of a program for systematizing information was instrumented.

As part of the works of the Mexico-Japan Dissemination Area, a video production sub-program was included with the following results:

Mexico-Japan Co-production video programs:

- Earthquake in Kobe, short version 19 min.
- Earthquake in Kobe, long version 26 min.

Mexican production:

- Welcome to CENAPRED, 19 min.
- In the Presence of a Volcano, 21 min.

(2) ACHIEVEMENTS DURING THE EXTENSION PERIOD OF THE PROJECT

In order to establish a unique channel to disseminate the information edited by the Center, the Mexico-Japan Dissemination Sub-committee was created, which elaborated a joint program to supervise its operation and evaluate results.

For the extension period, activities were based in the program of the Mexico-Japan Dissemination Sub-committee, with the following results:

From June to December, 1995

1) "Cuadernos de Investigación" and other Publications

Three "Cuadernos de Investigación" were printed (issues 22-24), and it has been foreseen to print 16 issues more by the end of the Agreement extensión (25-40).

Other Publications

- Manual for the Pseudodyinamic Test
- Portatil Seismograph of Broad Band
- Damages by the 1985 Earthquake in Michoacan
- Research Activity at CENAPRED on Strong-Motion Seismology for Disaster Prevention (Collection of Research Papers).
- Codes of Urban Construction for Arquitects and Engineers
- Introduction to the Method of Controlled Line Test by Computer (Pseudodynamic Test)
- Research Activity at CENAPRED on Strong-Motion Seismology for Disaster Prevention (Abstracts)
- Soldering with Pressure and Gas
- Manual of Soldering with Pressure and Gas
-Introduction to the Codes of Construction in Japan.

2) Preparation of Technical-Didactic of Videos:

-Gas and pressure welding (translation of the Japanese production).
-Gas and pressure welding (production and carrying out in Mexico).
-Welcome to CENAPRED (English version).
-Welcome to CENAPRED (Japanese version).
-Seismic Instrumentation (under working).
-Full Scale Structures Testing (under working).

CENAPRED production:
-Destiny: the "Popocatépetl" Glacier.
-Never More.
-Hurricanes: Prepare to Survive.
-Chemical Disaster in Pasadena.

3) Others Achievements:

-International Seminar on Technologies and Methodologies for Disaster Prevention.
-3rd Course on Seismic Safety of Constructions for Directors Responsible for Works.
-4th Course on Seismic Safety of Constructions for Directors Responsible for Works.
-5th Course on Seismic Safety of Constructions for Directors Responsible for Works.
-International Course on Seismic Safety of Constructions for Directors Responsible for Works (Central America and the Caribbean Region)

ANNEX

ANNEX.- I.

EXPERTS FOR JAPANESE EQUIPMENTS (Long Term)

Advisor for Japanese Teams

Fumio Endo	(17/05/90-30/06/92)
Hiroyuki Uno	(22/06/92-21/06/93)
Tatsuo Murota	(03/06/93-13/05/95)
Shigeharu Morishita	(03/05/95-02/05/96)
Masao Nozawa	(20/03/96-31/03/97)

Earthquake - Resistant Structural Engineering

Kazuhiko Ishibashi	(01/10/90-30/09/91)
Hideo Katsumata	(15/07/91-14/07/92)
Koji Yoshimura	(15/06/92-14/06-93)
Kenji Kikuchi	(31/05/93-30/05/94)
Naoki Tanaka	(28/03/94-31/03/95)

Materials Testing

Motoji Saito	(26/09/91-25/09/92)
Hideaki Kitajima	(19/09/92-13/09/93)

Seismic Instrumentation

Kojiro Irikura	(20/12/90-19/12/91)
Hiroshi Kawuase	(04/11/91-03/11/92)
Takeshi Mikumo	(01/10/92-31/03/93)
Kasuaki Masaki	(28/03/94-31/03/95)

Data Base

Hitoshi Tanigushi	(16/12/91-15/12/93)

Building Standard

Naomi Honda	(07/05/92-06/05/94)
Hideaki Sato	(01/04/94-31/03/97)
Takeshi Junonji	(08/05/95-31/03/97)

Japanese Teams Coordinator

Mitsuo Yoshida	(14/05/90-04/07/95)
Takashi Toyama	(01/06/95-31/03/97)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1990)

Earthquake - Resistant Structural Engineering

Kazuhiko Ishibashi	(30/08/90-07/09/90)
Tatsuo Murota	(30/08/90-07/09/90)
Akira Sogame	(30/08/90-07/09/90)
Katsuhiko Endo	(30/08/90-07/09/90)
Tsuneo Okada	(22/02/90-01/03/90)
Katsuhiko Endo	(22/02/90-01/03/90)
Setsuro Nomura	(22/02/90-01/03/90)

Seismic Instrumentation

Yoshikazu Kitagawa	(25/10/90-05/11/90)
Kojiro Irikura	(25/10/90-06/11/90)
Haruo Sato	(01/11/90-22/11/90)
Tadao Minami	(21/02/91-01/03/91)

Civil Protection

Kunihiko Tsubaki	(02/12/90-09/12/90)
Shuji Mukunoki	(02/12/90-09/12/90)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1991)

Earthquake - Resistant Structural Engineering

Hideo Katsumata	(22/04/91-03/05/91)
Motoji Saito	(17/07/91-27/07/91)
Yasuhisa Sonobe	(19/08/91-31/08/91)
Masaya Murakami	(19/08/91-28/08/91)
Masaomi Teshigawara	(10/02/92-24/02/92)

Building Standard

Susumu Kumahara	(09/03/92-21/03/92)

Seismic Instrumentation

Masumi Yanagisawa	(12/09/91-27/09/91)
Masanori Horike	(04/11/91-27/11/91)
Tomotaka Iwata	(04/11/91-27/11/91)
Takao Kagawa	(04/11/91-27/11/91)
Kazuo Seo	(04/11/91-27/11/91)
Takanori Samano	(04/11/91-27/11/91)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1992)

Earthquake - Resistant Structural Engineering

Shunsuke Sugano	(22/04/92-03/05/92)
Masaya Hirosawa	(14/05/92-25/05/92)
Takashi Kaminošono	(11/05/92-27/05/92)
Kenji Kikuchi	(31/01/92-13/01/93)
Yutaka Yamazaki	(08/02/93-17/02/93)
Hiroyuki Satake	(29/03/93-04/04/93)

Soils Mechanics Engineering

Munenori Hatanaka	(21/01/93-06/02/93)

Materials Testings

Ikuo Kikuchi	(22/02/93-05/03/93)

Building Standard

Ichiro Nagao	(25/03/93-07/04-93)

Seismic Instrumentation

Takeshi Mikumo	(14/05/92-30/06-92)
Takashi Miyatake	(04/01/93-30/01/93)
Daisuke Suetsugu	(28/03/93-06/04/93)
Yuzo Shinozaki	(27/03/93-05/04/93)

Database

Masata Sugito	(10/03/93-20/03/93)
Hiroshi Ota	(28/03/93-11/04/93)
Makoto Kawamura	(28/03/93-03/04/93)
Fusanori Miura	(25/03/93-06/04/93)

Course speaker (Seminar)

Ichiro Nakanishi	(14/05/92-22/05/92)
Masaya Kikuchi	(14/05/92-22/05/92)
Shigeo Kinoshita	(14/05/92-22/05/92)
Hiroyuki Aoyama	(15/05/92-26/05/92)
Tsuneo Okada	(16/05/92-22/05/92)
Tsuneo Katayama	(17/05/92-22/05/92)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1993)

Earthquake - Resistant Structural Engineering

Toshifumi Fukuta	(10/05/93-22/05/93)
Masayoshi Nakashima	(13/09/93-21/09/93)
Shuñsuke Otani	(23/09/93-05/10/93)
Hiroshi Noguchi	(27/09/93-06/10/93)

Seismic Instrumentation

Kasuo Furuya	(14/06/93-30/06/93)
Toshio Tozawa	(14/06/93-30/06/93)
Kazuro Hirahara	(16/09/93-12/10/93)
Kazuaki Masaki	(20/09/93-01/10/93)

Database

Yoshinori Furumoto	(20/09/93-05/10/93)
Masahiro Iida	(17/10/93-12/11/93)

Course Speaker (Seminar)

Novuyuki Mori	(19/08/93-04/09/93)
Ryozo Umezawa	(22/08/93-29/08/93)
Teiichi Takahashi	(22/08/93-29/08/93)
Takechi Toda	(22/08/93-28/08/93)
Yoshiaki Nakano	(14/02/94-23/02/94)
Takashi Kaminosono	(14/02/94-02/03/94)
Toshifumi Fukuta	(14/02/94-02/03/94)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1994)

Earthquake - Resistant Structurel Engineering

Yasushi Shimizu	(11/04/94-24/05/94)
Jun Tagami	(24/10/94-03/12/94)
Hiroto Kato	(29/09/94-02/11/94)
Hiroyuki Aoyama	(21/01/95-04/02/95)

Seismic Instrumentation

Shigeo Kinoshita	(01/09/94-21/09/94)
Kojiro Irikura	(21/07/94-31/08/94)
Kenji Tanaka	(31/10/94-23/11/94)

Soils Mechanics Engineering

Kasuya Yasuhara	(01/07/94-08/09/94)

Course Speaker (Seminar)

Masamichi Okubo	(05/11/94-22/11/94)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1995)

Earthquake - Resistant Structural Engineering

Takashi Kaminosono	(15/06/95-30/06/95)
Shunsuke Sugano	(15/06/95-24/09/95)
Masaomi Teshigawara	(29/09/95-02/11/95)

Seismic Instrumentation

Kenji Tanaka	(09/11/95-24/11/95)

Pressure and Gas Welding

Noboaki Miyagi	(06/11/95-01/12/95)
Shuichi Kohno	(06/11/95-01/12/95)

Course Speaker (Seminar)

Takashi Kaminosono	(15/06/95-30/06/95)

EXPERTS FOR JAPANESE EQUIPMENTS (Short Term, 1996)

Earthquake - Resistant Structural Engineering

Masaomi Teshigawara (10/06/96-06/07/96)

Data Base

Takashi Kaminosono (11/06/96-13/07/96)

Course Speaker (Seminar)
Takashi Hasegawa (11/06/96-29/06/96)

ANNEX.- II.

COUNTERPART PERSONNEL TRAINED IN JAPAN

1990	FIELD	NAME	PERIOD	REMARKS
1.	Observation of Strong Ground Motion.	Roberto Quaas	1990. 8.21-1990 9.20	
2.	Observation of Strong Ground Motion.	Enrique Guevara	1990. 8.21-1990 9.20	
3.	Seismic Design of Structures.	Lorenzo Sánchez	1990. 8.20-1990 9.12	
4.	Seismic Design of Structures.	Roberto Meli	1990. 9.24-1990 10.6	
5.	Building Stancare	Salvador Pomar	1990. 9.24-1990 10.9	First Director of CENAPRED (individual course). (Grous course)
6.	Dissemination	Ricardo Cícero	1990. 9.24-1990 11.18	

1991	FIELD	NAME	PERIOD	REMARKS
1.	Seismic Design of Structures.	Fermin León	1991. 9. 3-1991 11.2	(Retired)
2.	Observation of Strong Ground Motion.	Mario Ordáz	1992. 3.22-1992 4.17	
3.	Observation of Strong Ground Motion.	Carlos Gutiérrez	1992. 3. 2-1992 4.4	

1992	FIELD	NAME	PERIOD	REMARKS
1.	Seismic Design of Structures.	Sergio Alcocer M.	1992. 11. 3-1992 11.26	
2.	Data Base of Strong Ground Motion.	Salvador Medina M.	1993. 1.13-1993 3.11	
3.	Disaster Prevention for the Citizens.	Santiago Mota B.	1993. 3. 6-1993 3.18	(High level course).

1993	FIELD	NAME	PERIOD	REMARKS
1.	Seismic Design of Structures.	Tomás Sánchez P.	1993. 8.31-1993 11.30	
2.	Evaluation of Strong Ground Motion.	Bertha López N.	1993. 9.23-1993 10.30	
3.	Earthquake Disaster Prevention.	Socorro Díaz P.	1993. 11.24-1993 11.30	(Former Subsecretary of Ministry of Interior).

1994	FIELD	NAME	PERIOD	REMARKS
1.	Evaluation of Strong Ground Motion.	Miguel A. Santoyo.	1994. 5.17-1994 7.5	
2.	Seismic Design of Structures.	Oscar A. López.	1994. 7. 5-1994 8.10	
3.	Foundation of Building and Soil Mechanics.	Manuel Mendoza L.	1994. 10. 4-1994 10.31	

1995	FIELD	NAME	PERIOD	REMARKS
1.	Earthquake Engineering.	Alonso Echavarria.	1995. 11.1-1995 12.15	
2.	Prevention of Disasters.	Guillermo Rendón.	1996.1.16-1996 3.15	

1996	FIELD	NAME	PERIOD	REMARKS
1.	Training Techniques on Seismic Disaster Prevention.	Tomás Sánchez.	1996. 10.10-1996 11.20	
2.	Codes of Construction in Japan.	Ricardo de la Barrera Sta. Cruz.	1997.1. 9-1997 2. 7	

ANNEX - III.

PROVISION OF MACHINERY AND EQUIPMENT (Original Period)

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1990	VIII	Strong M.	Vehicle Model:Suburban '90	1	Mexico	3,801,000
1990	I	Strong M.	Work Station SUN Sparc Station 2 (4/75 GX-16-P40).	1	Mexico	7,520,000
1990	I	Strong M.	Work Station Sparc Station SLC (4/20FM-8).	1	Mexico	
1990	I	Strong M.	External 1/4 Tape Unit 150MB (X565H).	1	Mexico	
1990	I	Strong M.	Laser Printer SPARCPRINTER (SPRN400).	1	Mexico	
1990	I	Strong M.	Ethernet Tranceptor (THIN).	2	Mexico	
1990	I	Strong M.	External Disk SCSI (207 MB) (X552Z).	1	Mexico	
1990	I	Strong M.	Operational System SUM 05 (SS2-07).	1	Mexico	
1990	I	Strong M.	SUNOS Manual (SX-09).	1	Mexico	
1990	I	Strong M.	O-W User Manual (OWN1.1XX9).	1	Mexico	
1990	I	Strong M.	Developer's Set Manual (OWN1.1XXNU).	1	Mexico	
1990	I	Strong M.	SUN Fortran (For 1.3434R5).	1	Mexico	
1990	I	Strong M.	Fortran Manual (For 1.3XX9).	1	Mexico	
1990	I	Strong M.	SUN GRAPHICS KERNEL SYSTEM (GKS-3.0-4-34R-5).	1	Mexico	
1990	I	Strong M.	SUNGKS Manual (GKS-3.0-X-X-9).	1	Mexico	
1990	I	Strong M.	Software, Manual, User Licence PC-NFS.	1	Mexico	
1990	I	Strong M.	Ethernet Control Board For PC.	1	Mexico	
1990	IX	Struc.Test	Clip Gauge Model: RA	2	41202	30,200

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1990	IX	Struc.Test	Compresometer Model:CNB	1	41202	615,400
1990	IX	Struc.Test	Bridge Bearing:Model BP-A-121 300 t.	2	41202	1,805,600
1990	IX	Struc.Test	Bridge Bearing:Model BP-A-106 100 t.	2	41202	625,400
1990	IX	Struc.Test	Double Acting Hydraulic Jack Mod: JR-400.	1	41202	1,487,900
1990	IX	Struc.Test	Concrete Test Hammer: Schmidt NR with Recorder.	1	41202	257,200
1990	IX	Struc.Test	Hydraulic Distributator 8 Division/stop Valve.	1	41202	317,700
1990	IX	Struc.Test	Personal Computer EPSON PC-386LS-H40.	1	41202	600,000
1990	IX	Struc.Test	HARD DISK PACK (PCL HD-40).	1	41202	150,000
1990	IX	Struc.Test	ENS BOARD (EMJ400L).	1	41202	50,000
1990	IX	Struc.Test	Interface Board (GP-IP Board)/cable.	1	41202	39,000
1990	IX	Struc.Test	Scanner (GP 6000).	1	41202	200,000
1990	IX	Strong M.	Digital Multimeter (XD-760CA).	1	41202	40,150
1990	IX	Strong M.	Short Wave Radio (ICF-SW7600) SONY.	1	41202	38,350
1990	IX	Strong M.	Mini-Recorder (WR-7400).	1	41202	343,000
1991	I	Struc.Test	Personal Computer (J3100SGX11).	1	94249	1,316,000
1991	I	Struc.Test	Exp. Memory (2Mb: J31MESG1).	1	94249	130,000
1991	I	Struc.Test	Mouse (J31MS001)	1	94249	9,000
1991	I	Struc.Test	MS-DOS (English) VER. 3.3.	1	94249	30,000

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1991	I	Struc.Test	Aut-Voltage Regurater AC127 500W.	1	94249	130,000
1991	I	Struc.Test	Laser Printer (L-580 Kyosera).	1	94249	358,000
1991	I	Struc.Test	Switch Box for TDS-301 ASW-50B.	2	94249	1,870,000
1991	I	Struc.Test	Strain Gauge 10mm 1/1000mm CDP-10-	10	94249	485,000
1991	I	Struc.Test	Strain Gauge 25mm 1/500mm CDP-25.	10	94249	485,000
1991	I	Struc.Test	Strain Gauge 100mm 1/100mm CDP-100.	4	94249	316,000
1991	I	Struc.Test	Strain Gauge 200mm 1/100mm SDR-200R.	10	94249	725,000
1991	I	Struc.Test	Load Cell 5t CLM-5t.	2	94249	480,000
1991	I	Struc.Test	Digital Indicator Mod:F360.	1	94249	190,000
1991	I	Struc,Test	XY Plotter 8 pen Type A-3 Mod:FR-6301.	1	94249	500,000
1991	I	Struc.Test	RS-232C Cable.	1	94249	12,000
1991	I	Strong M.	Handy Corder, 4 Channel Mod:8K33.	1	94249	714,000
1991	I	Strong M.	Handy Digital Oscilloscope Mod: 222.	1	94249	620,000
1991	I	Strong M.	Seismometer Sensor for SMAC-MD, V-401 Akashi.	1	94249	687,000
1991	VI	Strong M.	IC ROM Board.	3	By hand	510,000
1991	VI	Strong M.	CPU Board	3	By hand	645,000
1991	VI	Strong M.	RPU Board	3	By hand	630,000
1991	VI	Strong M.	Softways for Telemeter System.	1	By hand	11,260

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1991	VI	Strong M.	Personal Computer Model: J3100SX.	1	By hand	348,000
1991	III	Strong M.	Detector Model: JEP-4A3.	4	0855	2,877,200
1991	III	Strong M.	Cable 160m/set.	2	0855	576,000
1991	III	Strong M.	Connecter.	4	0855.	220,000
1991	XI	Struc.Test	Hydraulic Actuator MTS Model: 244.51.	1	U.S.A.	23,854,000
1991	XI	Struc.Test	Oven for Testing Material: HCF-102.	1	Mexico	823,000
1991	XI	Strong M.	Vehicle Model: Nissan "Ichiban" '91.	1	Mexico	2,782,000
1991	XI	Strong M.	Portable Reference Clock: Nanometrics 501F.	1	U.S.A.	326,000
1991	XI	Strong M.	Laptop Computer: Toshiba (T-2200sx/8770).	1	Mexico	715,000
1991	XI	Strong M.	Scopmeter: Fluke Model 97.	1	U.S.A.	322,000
1991	XI	Strong M.	Portable Electric Generator: Honda EM-650.	1	Mexico	115,000
1991	XI	Strong M.	Variable Bipolar DC Power Supply: HP 6263B.	1	Mexico	171,000
1991	XI	Strong M.	Function Generator: HP 3312A.	1	Mexico	317,000
1991	XI	Strong M.	Frequency Counter: HP 5315A.	1	Mexico	249,000
1991	XI	Strong M.	Laser Printer: HP LaserJet IIIp.	1	Mexico	305,000
1991	XI	Strong M.	Software: Mathworks Matlab for SUN.	1	U.S.A.	1,754,000
1991	XI	Strong M.	Optical Fiber Network.	1	Mexico	9,137,192
1991	XI	Strong M.	Work Station: SUN SPARC STATION 2 , with LA SIG.	2	Mexico	14,745,000

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1991	XI	Strong M.	File Server Pack: 1. 3Gb Disk. 2.3Gb tape, 644MB CD.	2	Mexico	
1991	XI	Strong M.	SUN IPX: Color Monitor 16', 207MB Disk, etc.	1	Mexico	
1991	XI	Strong M.	Manual for SUN.	1	Mexico	
1991	XI	Train. Dis.	Videotecorder System 3/4: Sony VO-9800.	1	Mexico	1,026,000
1991	XI	Train. Dis.	Edition Controler: Sony RM-450.	1	Mexico	
1991	XI	Train. Dis.	Effect Generator: Sony DME-450.	1	Mexico	1,103,000
1991	XI	Train. Dis.	Spotligth with Fun.	2	Mexico	89,780
1991	XI	Train. Dis.	Lightbox for Slides,	2	Mexico	72,494
1991	XI	Train. Dis.	Screen with Tripoid.	1	Mexico	51,456
1991	XI	Train. Dis.	Synchorecorder. Model 5610.	1	Mexico	137,886
1991	XI	Train. Dis.	Portable Sound Equipment: Asahi 1063.	1	Mexico	112,158
1991	XI	Train. Dis.	Cordless Mini-microphone: SUMA super SHF.	1	Mexico	45,560
1992	III	Strong M.	Digitizer System: Mod. Q680/sxs8-G-TCP.	1	U.S.A.	4,766,393
1992	III	Strong M.	Triaxial Seismometer STS-2.	1	U.S.A.	1,732,767
1992	III	Strong M.	Radio Modem: 1 Central and 7 Substations.	8	Mexico	6,392.200
1992	III	Struc.Test	Hydraulic Power Supply, MTS Model 506.62.	1	U.S.A.	8,571,108
1992	III	Struc.Test	Electric Hydraulic pomp: Model LH-3,7P.	1	4261	2,774,000
1992	III	Struc.Test	Controler for Loadcell Model:OX-201TC.	1	4261	1,066,000

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1992	III	Strong M.	Circuit Board for SMAC-MD.	3	4261	750,000
1993	XII	Strong M.	Three Component Broadband Sismometers CGM-40T.	6	Ingland	2,354,739
1993	XII	Strong M.	Gural Handheld Control Unit.	1	Ingland	166,233
1993	XII	Strong M.	DC/DC Converters for Sismometers.	6	Ingland	150,550
1993	XII	Strong M.	Digital Recorder Terraprobe: 72A-07/DAT.	6	U.S.A.	9,895,565
1993	XII	Strong M.	Tape Storage Subsystem:72A-03/DAT.	2	U.S.A.	933,040
1993	XII	Strong M.	Hand Terminal PC with FSC:RT/PC-FSC.	2	U.S.A.	348,800
1993	XII	Strong M.	Enclosure For 72A-07/DAT.	6	U.S.A.	425,100
1993	XII	Strong M.	BIS 486DX2-50 Notebook PC: NP 209.	2	U.S.A.	1,086,730
1993	XII	Strong M.	PC ACER 486 DX/33.	1	Mexico	342,805
1993	XII	Strong M.	Super VGA Monitor 7033D 14".	1	Mexico	53,995
1993	XII	Strong M.	Modem BOCA 2400 with software.	1	Mexico	24,525
1993	XII	Strong M.	Comunication Port Board.	2	Mexico	11,990
1993	XII	Strong M.	Acelerograph Digital IDS-36025.	1	Mexico	817,500
1993	XII	Strong M.	Digitalizer Drawing Board III Mod. 34600.	1	Mexico	443,265
1993	XII	Strong M.	Electronic Cursol (16 buttons).	1	Mexico	23,641
1993	XII	Strong M.	Color Printer.	1	Mexico	942,575
1993	XII	Strong M.	Ethernet Board.	4	Mexico	101,900

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1993	XII	Strong M.	ER-Mapper (Software).	1	Mexico	2,343,191
1993	XII	Strong M.	ER-Mapper Actualization.	1	Mexico	213,990
1993	XII	Strong M.	ACR/INFO (Software for GIS).	1	Mexico	3,963,910
1993	XII	Strong M.	TIN (software for GIS).	1	Mexico	855,960
1993	XII	Strong M.	Network (Software for GIS).	1	Mexico	855,960
1993	XII	Strong M.	SUN C** (25 licences for SOLARIS 2x).	1	Mexico	397,410
1993	XII	Strong M.	SUN-PC Comunication System for SOLARIS 2x.	1	Mexico	80,200
1993	XII	Strong M.	PC-NFS Emulation System for SOLARIS 2x.	4	Mexico	179,548
1993	XII	Train. Dis.	Personal Computer (HP Vectra 486 SX).	5	Mexico	1,434,243
1993	XII	Train. Dis.	LaserJet Printer (HP LaserJet 4).	5	Mexico	1,217,705
1993	XII	Train. Dis.	Exp. Memory 8MB.	3	Mexico	203,596
1993	XII	Train. Dis.	Exp. Memory 4MB.	2	Mexico	89,570
1993	XII	Train. Dis.	Word for Windows v. 5.2 (Software).	1	Mexico	50,441
1993	XII	Train. Dis.	Excel for Windows v. 4.0 (Software).	1	Mexico	50,441
1993	XII	Train. Dis.	Power Point for Windows v. 3.0 (Software).	1	Mexico	50,441
1993	XII	Train. Dis.	Ventura Publisher for Windows v. 4.1 (Software).	1	Mexico	94,767
1993	XII	Train. Dis.	Pagemarker for Windows v. 5.0 (Software).	1	Mexico	89,163
1993	III	Struc.Test	Hydraulic Actuator MTS Mod. 244.51 (1000t).	1	Mexico	11,968,155

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1993	III	Struc.Test	Servovalve for Actuator (50t).	2	Mexico	
1993	III	Struc.Test	Electric Station for Laboratory (Transformer, etc.).	1	Mexico	1,711,868
1993	III	Strong M.	GPS Synchronized Time Code Unite (GPS-805).	1	U.S.A.	677,126
1993	III	Strong M.	Digital Oscilloscope with Printer (TDS-320).	1	U.S.A.	522,951
1993	III	Strong M.	Personal Computer (Acer 486).	2	Mexico	785,955
1993	III	Strong M.	Monitor Super VGA.	2	Mexico	
1993	III	Strong M.	GPS Portable Time System (TCG-300).	5	U.S.A.	1,194,778
1993	III	Strong M.	Uninterrupted Power Supply (DELTEC: PRA-1000).	1	Mexico	134,508
1993	III	Strong M.	Radio Modem (Skyplex).	1	Mexico	792,476
1994	IX	Strong M.	PS Logging System (Suspension PS log 170).	1	2260	6,824,527
1994	IX	Struc.Test	Load Cell (Mod:CLP-300B).	1	2260	430,000
1994	IX	Struc.Test	Circuting Head and Standa Plate for Load Cell.	1	2260	80,000
1994	XI	Struc.Test	Loading Frame.	1	Mexico	5,794,922
1994	XI	Struc.Test	Digital Accelerograph (IDS-3602A).	1	U.S.A.	599,200
1994	XI	Struc.Test	Digital Recorder (IDS - 3602AX).	5	U.S.A.	2,614,592
1994	XII	Struc.Test	Earth Pressure Cell with Peizometer Mod: 3500.	4	U.S.A.	333,433
1994	XII	Struc.Test	Piezometer Mod: 3410.	3	U.S.A.	200,000
1994	XII	Struc.Test	VW Earth Pressure Cell Mod: 4800E.	4	U.S.A.	288,728

Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1994	XII	Struc.Test	VW Piezometer Mod: 4500S	3	U.S.A.	131,352
1994	XII	Struc.Test	Leadout with 4900 Load Cell Adaptor Mod: GK-403.	1	U.S.A.	264,868
1994	XII	Struc.Test	VW Load Cell Mod: 4900-400-4.0.	3	U.S.A.	265,457
1994	XII	Struc.Test	Computer Compaq 486.	1		488,556
1994	XII	Struc.Test	Graphical Programming System.	1	U.S.A.	219,390
1994	XII	Struc.Test	Multi A/D and Timing I/O Board.	1	U.S.A.	76,461
1994	XII	Struc.Test	4 Channel Isolation Amplifier.	1	U.S.A.	109,445
1994	XII	Struc.Test	4 Slot Chassis.	1	U.S.A.	76,462
1994	XII	Struc.Test	High-voltage Terminal Block.	1	U.S.A.	16,492
1994	XII	Struc.Test	Feedthrough Panel SCXI-1180.	1	U.S.A.	20,990
1994	XII	Struc.Test	I/O Connector Block.	1	U.S.A.	19,990
1994	XII	Strong M.	3 Compoonent Broadband Seismometer CMG-40T.	3	Ingland	1,971,614
1994	XII	Strong M.	DC/DC Converters	3	Ingland	
1994	XII	Strong M.	Terraprobe Mod: 72A-07/DAT.	3	U.S.A.	5,378,809
1994	XII	Strong M.	Tape Storage Subsystem 1.3GB 72A-03/DAT.	1	U.S.A.	
1994	XII	Strong M.	AC Adapter PA/8709U.	1	U.S.A.	
1994	XII	Strong M.	SCSI Interface Board for PC RT/ASC-86.	1	U.S.A.	

PROVISION OF MACHINERY AND EQUIPMENT (Extension Period)

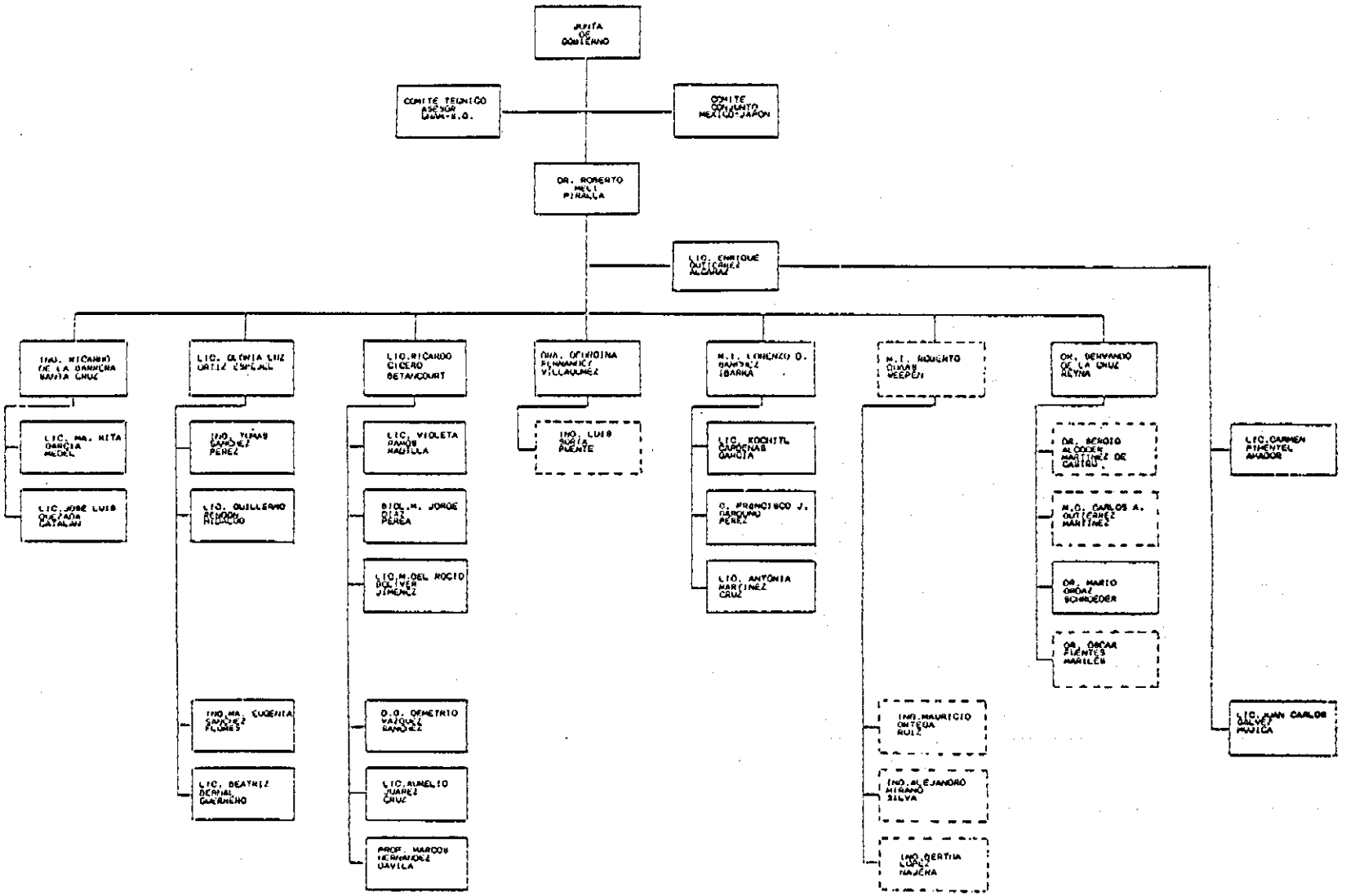
Year	Mon	Area	Items	Qua	Adq.Ref	Amount (Yen)
1995	11	Soil	Drying Oven (To dry up samples of soil).	1	Mexico	34,033
1995	11	Traini.	Scanner 3C P/PC 24 BIT COLOR 8BIT GRISES, 2400.	1	Mexico	132,594
1995	11	Struc. Test	Impact wrench AT770, Connector AHC28F, Filter AHR420A, Impact wrench horse AH7, Nut im302, IM482 (2), IM342, IM582, IMM312, IMM322, IMM362, IMM402.	1		125,704
1995	11	Strong M.	Acer 486 Computer, procesador Intel 486 DX2, velocidad 66 Mhz, monitor super VGA de 14", 16 MB en RAM, disco duro de 545 MB, drive de 3.5", teclado en español, mouse, MS-DOS 6.22.	1	Mexico	359,628
1995	11	Strong M.	Unidad de disco flexible de 5.25" alta densidad.	1	Mexico	
1995	11	Strong M.	Tarjeta de red Ethernet de 16 bits.	1	Mexico	
1995	11	Strong M.	Impresor HP Laser Jet 5P (6 paginas por minuto, 600 ppp, 2MB en RAM).	1	Mexico	
1995	11	Strong M.	Compaq Prosignia 300 Computer (EISA-PCI) 586 a 90 MHz, 16 MB en RAM expandible basta 208 MB, disco duro de 1.05 GB fast SCSI-2, drive de 3.5", controladora SVGA, CD-ROM, arquitectura Triflex-PCI, Compaq smart start, insight manager, tarjeta Ethernet de 32 bits.	1	Mexico	500,972
1995	11	Strong M.	Monitor de color Acer SVGA de 14", Multisync	1	Mexico	

Year	Mon	Area	Items	Qua	Adq. Ref	Amount (Yen)
1995	11	Strong M.	Compaq Prosignia 300 Computer (EISA-PCI) 586 a 75 MHz, 16 MB en RAM expandible hasta 208 MB, disco duro de 1.05 GB Fast SCSI-2, drive de 3.5", controladora SVGA, CD-ROM, arquitectura Triflex-PCI, Compaq smart, insight manager, tarjeta Ethernet de 32 bits.	1	Mexico	490,198
1995	11	Strong M.	Acer SVGA de 14" Monocromatic Monitor.	1	Mexico	
1995	11	Strong M.	Unidad externa Syquest de 270MB, 16 bits, Cartucho 3.5" HH, tiempo de lectura de 14.5 MS. Adapt. paralelo.	1	Mexico	136,007
1995	11	Strong M.	Cartuchos para disco duro removible 270 MB Syquest.	1	Mexico	
1996	1	Training	Acer Pentium Computer, Procesador Intel 586 velocidad 75 MHz, monitor super VGA de 14", 16 MB en RAM, disco duro de 850 MB, drive de 3.5", CD-READER, 2 bocinas microfono, teclado en español mouse MS-DOS 6.22, windows para trabajo en grupo V 3.11 tarjeta de video PCI con 2 MB de memoria	1	Mexico	643,632
1995	1	Struc.Test	(Reinforcement detector) Sistema de detección de armado de concreto FERROSCAN, FS 10, contiene un monitor RV 10, explorador RS 10, batería RB 10, cargador de TCU 12H, RR10 papel y regla de trazo de referencia, estuche para su transporte Software).	1	Mexico	1,350,133
1996	1	Struc.Test	Software for FEM (SBETA)	1	49625-313	1,036,906
1996	1	Struc.Test	(Crack Detector 35-2300/02 model) Medidor ultrasonico pundit modelo: 35-2300/02 dos transductores de 54hz Barra de calibracion, agente de acoplamiento, maletin para transporte e instructivo de operaciones.	1 set	Mexico	395,305

Year	Mon	Area	Items	Qua	Adq. Ref	Amount (Yen)
1996	1	Struc.Test	(Equipment to register struc. seismic response Acelerografo Digital Multi-tarea (K-2) Cable RS-232 de PC a K2.	8 1	2634	5,704,167
1996	1	Strong M	(Work Station) ULTRA 170 MODELO A11-UBA1-1A-06 A 4b NO.DE SEIE MONITOR: 550F2F67 TECLADO Y MOUSE (NO. DE SERIE: 9524101132) SOLARIS 2.X MODELO SOLD-C MODELO X7001A.	1 set	Mexico	2,520,716
1996	3	Strong M.	DATA LOGGER MODEL: TDS-601A (8MB).	1 set	NYKS-0017 12210	2,540.428
1996	3	Struc. Test.	(Equipment to register struc. seismic response Acelerografo Digital Multi-Tarea (ETNA) Cable RS-232 de PC a ETNA	8 1		4,895.000

ORGANIC STRUCTURE

CENAPRED



ANNEX.- IV.

ORGANIC STRUCTURE

CENAPRED

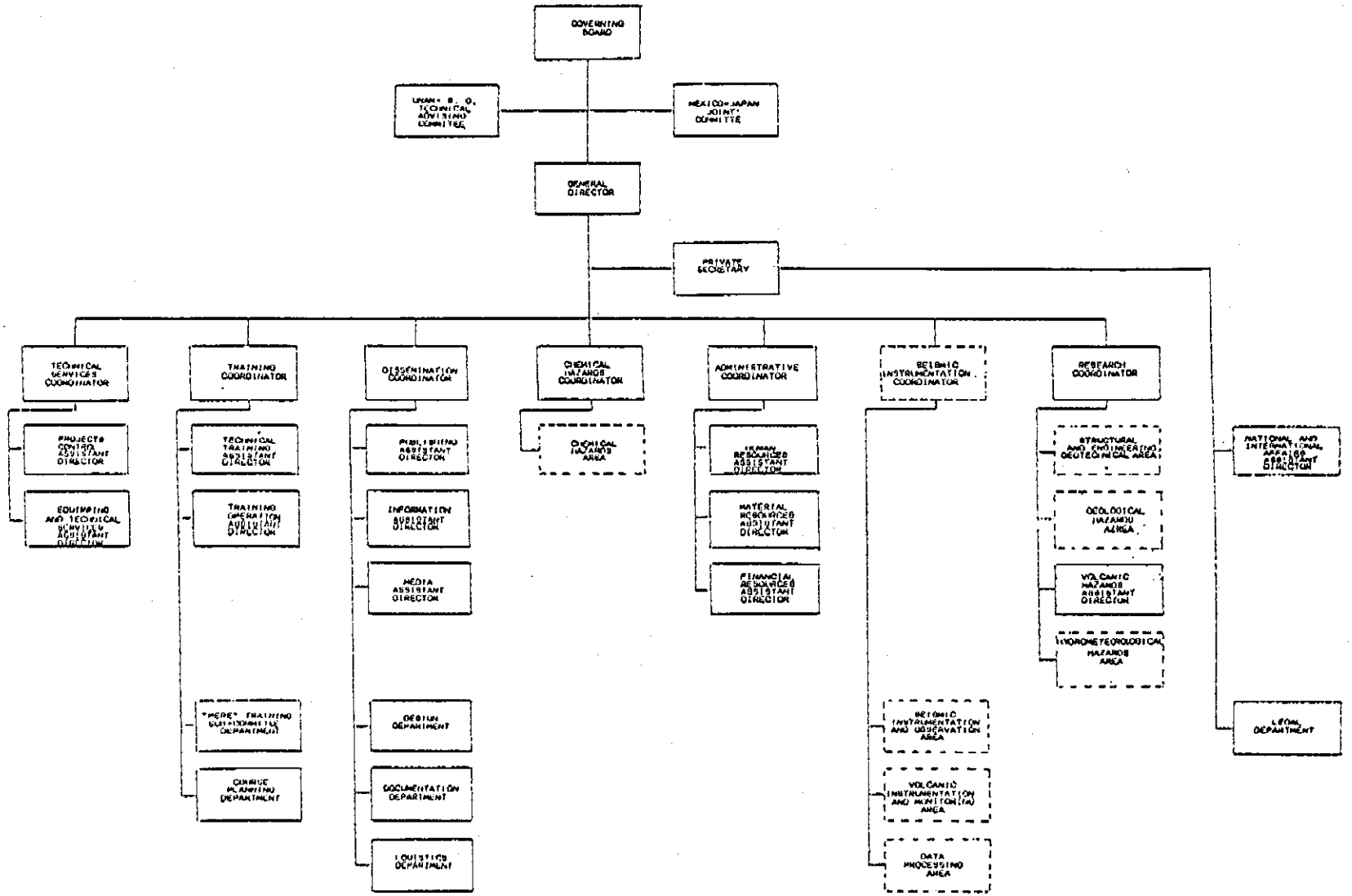


TABLE BUDGET 1990 - 1996

YEAR		CENTRALIZED	TOTAL
1990	$5,644.118.00	$722,447.00	$6,366.565.00
1991	$7,495.984.00	$922,006.00	$8,417.990.00
1992	$9,106.900.00	$1,165.683.00	$10,272.583.00
1993	$14,285.409.00	$1,825.675.00	$16,111.084.00
1994	$14,298.758.98	$1,844.539.00	$16,143.291.98
1995	$14,671.643.00	$1,867.090.00	$16,538.733.00
1996	$13,837.294 79	$$1,883.948.00	$15,721.242.79

* Centralized departures: (electricity, cleaning, vigilance, telephone services, garden services, assurance services, fuel to vehicles, fuel to equipments, maintenance and repairing of equipment, etc.).

The budget is allocated by Ministry of Interior based on the request from CENAPRED with the annual activity plan. However, the plan is not a detailed schedule but just an shown in TABLE ANNUAL BUDGET OF CENAPRED IN 1995. In fact, the budget is managed flexible so that certain budget of one item may be expended for another item an so far financial constraints did not apparently hinder the activities. However, lack of detailed budgeting system within a long term plan is thought to be an issue for more efficient operation of CENAPRED.

TABLE ANNUAL BUDGET IN 1995

Item	Amount (Pesos)	%
Personnel Expenses	4,386,673	29.9
Material & Maintenance	1,558,325	10.6
Services	8,558,645	58.3
Fixed Assets & Furniture	168,000	1.2
Total	14,671,643	100.0

TABLE ANNUAL BUDGET IN 1996

Item	Amount (Pesos)	%
Personnel Expenses	5,680,953.40	41.1
Material & Maintenance	1,555,021.79	11.3
Services	5,299,319.60	38.3
Fixed Assets & Furniture	1,302,000.00	9.3
Total	13,837,294.79	100.0

TOTAL BUDGET

COORDINATIONS	%	1995	%	1996
Research Coordination	20%	$2,934,328.00	20%	$2,767.459.00
Instrumentation Coordination	10%	$$1,467.164.00	10%	$1,383.729.00
Training Coordination	20%	$2,934.328.00	20%	$2,767.459.00
Dissemination Coordination	20%	$2,934.328.00	20%	$2,767.459.00
Technical Services Coordination	10%	$1,467.164.00	10%	$1,383.729.00
Administrative Coordination	10%	$1,467.164.00	10%	$1,383.729.00
General Direction and Private Secretary	10%	$1,467,164.00	10%	$1,383.729.00
TOTAL	100%	$14,671.640.00	100%	$13,837.293.00

Includes: Personnel Expenses, Material and Maintenance, Services.

TOTAL BUDGET

COORDINATIONS	%	1995	%	1996
Seismic Testing Area	35%	$1,027.015.00	35%	$968.610.00
Geological Risk Area	40%	$1,173.731.00	40%	$1,106.983.00
Hydrometeorological Risk Area	10%	$293.432.00	10%	$276.746.00
Chemical Risk Area	10%	$293.432.00	10%	$276.746.00
Research Coordination	5%	$146.716.00	5%	$138.373.00
TOTAL	100%	$29.343.326.00	100%	2,767.458.00

Includes: Personnel Expenses, Material and Maintenance, Services.

ACTIVITY PROGRAM

ANNEX-VI

SEISMIC INSTRUMENTATION COORDINATION

SEISMIC INSTRUMENTATION / DATA PROCESSING AND VOLCANIC MONITORING AREA

ACTIVITY	PERSON IN CHARGE	P• / C•	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Operation, maintenance and modernization of the seismic observation networks.	R. Quaas D. Almora R. Vázquez E. Guevara	P C	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	-	-	-	-	-	Permanent Activity
2) Improvement of the telemetry systems.	R. Quaas R. Vázquez E. Guevara	P C	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	-	-	-	-	-	
3) Monthly visits to the 5 stations of the attenuation network between Acapulco and Mexico, and to the 11 stations in Mexico City.	R. Quaas D. Almora R. Vázquez E. Guevara	P C	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	-	-	-	-	-	Permanent Activity
4) "Cuadernos de Investigación", with the accelerographic records of 1990, 1991 and 1992.	R. Quaas B. López	P C			- •																						The "Cuaderno de Investigación" was printed this month.
5) "Cuaderno de Investigación", with the accelerographic records of 1993.	R. Quaas B. López	P C														- •											
6) Reports "The Seismic Observation System for strong ground motions, CENAPRED".	R. Quaas B. López	P C						- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -												
7) "Operation Manual for the Seismic Observation System for strong ground motions, CENAPRED".	R. Quaas B.López	P C						- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -					- - - -	- - - -	- - - -	-				This activity was extended for 1996. Delayed and postponed to be concluded in Dec., 1996.
8) Installing of additional equipments at station 15, IMP.	R.Quaas E. Guevara	P C	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -							Concluded.

Programmed : P•
Carried out : C•

SEISMIC INSTRUMENTATION COORDINATION

SEISMIC INSTRUMENTATION / DATA PROCESSING AND VOLCANIC MONITORING AREA

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
9) Development of a PC program for the periodical and automatical interrogation of Mexico City's accelerographic stations which are linked to CENAPRED, via radio - modem.	E. Guevara M. Ortega A. Mirano	P C										•	•	•	•	•	•	•	•	•	•	•	•				
10) Study a way to link the stations of Chilpancingo, Mezcala and Iguala, through celular telephony at CENAPRED. "Improvement of the communication from CENAPRED to Acapulco and Cuernavaca Stations"	E. Guevara	P C																									It was not carried out due to the lack of resources.
11) Strong ground motion data base of CENAPRED.	R. Quaas B. López	P C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Permanent Activity. The 1994 annual document has been concluded. The document for 1995 is in process.
12) Telemetry network of stations and monitoring to know the seismic activity of the Popocatépetl volcano.	E. Guevara	P C	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-				This activity is being carried out since June, 1993. At present we are studying the installation of a sismological station for the Pico de Orizaba and Tacaná volcanoes.

Programmed : P-
Carried out : C*

RESEARCH COORDINATION

GEOLOGICAL AND VOLCANIC RISK AREA

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Data base and Geographical Information Systems (GIS's) on the seismic risk in urban areas (Colima City).	C. Montoya	P C	-	-	-	-	-	-	-	-	-	-	-														#1 Mexico City.
2) Computer sistem for SRO.	C. Montoya	P C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	The report "Methodology for Seismic Risk Objects" will be finished in February, 1996, and will continue unit 1997.
3) Similar GIS's to be applied in other cases (Acapulco).	C. Montoya	P C												-	-	-	-	-	-	-	-	-	-	-	-	-	The city chosen was Acapulco.
4) Enhancement of the macroseismic intensity data base.	C. Gutiérrez	P C														-	-	-	-	-	-	-	-	-	-	-	It is subjeted to hiring auxiliar personnel. It will be continued in 1997. Sitionned Programation.
5) Field surveys with the new broad-band instruments jointly carried out with the Institute of Geophysics. Research on the seismic source mechanism at the Pacific coast.	M. Santoyo	P C		-	-	-	-	-	-	-	-	-	-	-	-												"Survey on Seismic Source", stemmed for this project. Final report is under revision.
6)Site efectt analysis at Guzman City, Jal.	C. Gutiérrez	P C							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				Preliminar results are available; analisys with new techniques is being doveloped.
7) Portable seismic observation system - instrumentation of a building (IMP).	R. Durán	P C											-	-	-	-	-	-	-								The first stage was finished, there is a preliminar document. The second stage of the project (with a new configuration of the instrumentation), is subjected to the ground motion excitation and to the good operation of the instruments.
8) Computer models for volcanic risk and total risk maps for survey zones.	S.de la Cruz A. González	P C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Programmed : P-
Carried out : C*

RESEARCH COORDINATION

SEISMIC TESTING AREA: CONFINED MASONRY STRUCTURES

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Publication of the final report on the three - dimensional model.	S. Alcocer	P C	-																								We have the preliminar report. Tomás Sánchez is in charge of the final report
2) Publication of the final report on models with horizontal reinforcement.	S Alcocer	P C	-	-			-																				
3) Design of walls with artisan brick and mesh.	S. Alcocer	P C	-	-																							
4) Wall constructions.	S. Alcocar	P C			-	-	-																				
5) Model testing.	S. Alcocer	P C						-	-	-	-	-															
6) Design of walls with extruded brick.	S. Alcocer	P C										-	-														
7) Model construction.	S. Alcocer	P C												-	-	-	-	-	-								
8) Model testig.	S. Alcocer	P C														-	-	-	-	-	-						
9) Result analysis.	S. Alcocer	P C																-	-	-	-	-	-				
10) Publication of reports and practical recommendations.	S. Alcocer	P C																		-	-	-	-				
11) The desing of walls with a concrete blocK	S. Alcocer	P C											-														

RESEARCH COORDINATION

SEISMIC TESTING AREA: PSEUDODINAMIC TESTING SYSTEM

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Solve software problems with the MTS suppliers.	O. López	P C	- •	- •	- •	- •	- •	- •	- •	- •	- •																- Concluded -
2) Gauge the system to use the 50 ton actuators.	O. López	P C	- •	- •	- •	- •	- •	- •																			- Concluded-
3) Gauge the system to use the 100 ton actuators.	O. López	P C																- •	- •	- •	- •	-	-				Delayed due to problems when installing the pump. It was re-programmed.
4) Make devices and pressure gauges for the energy dissipators project and testings, jointly carried out with ADAS.	O. López	P C	- •	- •	- •				- •	- •	- •	- •	- •	- •	- •	- •	- •	- •	- •	- •	- •	-	-				Interrupted due to software problems with the computer. Besides there were no resources to change a broken device.
5) Pseudodynamic testings.	O. López	P C									- •	- •															
6) Interpretation and analysis of results.	O. López	P C											- •	- •	-												
7) Final report.	O. López	P C													- •												

Programed : P-
Carried out : C*

RESEARCH COORDINATION

SEISMIC TESTING AREA: REHABILITATED BUILDINGS DATA BASE

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Selection of common buildings; complete registration of each building.	S. Alcocer	P C										-	-	-													
2) One evaluation of the first level; elemental seismic behavior.	S. Alcocer	P C													-	-	-	-	-	-	-	-	-				
3) One index of seismic intensity compared to one intensity index.	S. Alcocer	P C													-	-	-	-	-	-	-	-	-	-	-	-	Permanent activity; depends on the availability of buildings.
4) Lineal and non - lineal flexible analysis.	S. Alcocer	P C																-	-								"
5) Environmental vibration testings.	S. Alcocer	P C																		-	-	-	-	-	-	-	"
6) Inspection and re-evaluation works.	S. Alcocer	P C																									To be performed after an earthquake.
7) Instrumentation of two buildings with accelerographs and displacement gauges.	S. Alcocer	P C													-	-	-	-	-	-	-	-	-	-	-	-	Equipments were received in December, 1995.

Programed: P-
Carried out : C*

RESEARCH COORDINATION

SEISMIC TESTING AREA: INSTRUMENTATION TO OBSERVE THE BEHAVIOR OF FOUNDING IN BUILDINGS

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Definition of a building to be instrumented and type of equipments to be installed.	S. Alcocer	P C													- - - -	- - - -	- - - -	- - - -	- - - -								
2) Instrumentation of a building.	S. Alcocer	P C																- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	

Programed: P-
Carried out: C*

TRAINING COORDINATION

TECHNICAL TRAINING AREA

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Course on Seismic Safety of Constructions for Directors Responsible for works (WRD).	G.L.Ortiz T. Sánchez	P C			•					•						•						•					Another course is foreseen in Activity number 3.
2) International Course on Seismic Safety of Constructions for Central America and the Caribbean Region - Detection of needs.	G. L. Ortiz T. Sánchez	P C	•	•	•	•	•	•	•	•	•	•	•	•													
3) International Course on Seismic Safety of Constructions for Central America and the Caribbean Region.	G.L. Ortiz T. Sánchez	P C																		•	•						From Sep.30 to October 4, 1996.
4) Course on Disasters Prevention and Civil Protection Programs Management with an Academic Degree - Diploma (Coordination of the Technical Module).	G.L. Ortiz T. Sánchez	P C						•								•	•										
5) Designing and elaboration of didactical materials to support technical and civil protection courses.	G.L. Ortiz T. Sánchez	P C							•	•		•	•	•			•										"Basic Guide for Identifying Risk and Eq. Disaster Prev. in Constructions". Videos, photographs, slides and manuals.
6) Training courses on "Gas and Pressure Welding ".	G.L. Ortiz T. Sánchez	P C								•												•					1st. fortnight of January.
7) External supports.	G.L. Ortiz T. Sánchez	P C	•						•	•				•			•			•			•				Seminars and Conferences. Support to Civil Engineers College and other institutions.

Programed: P-
Carried out: C*

DISSEMINATION COORDINATION

PUBLICATIONS, LIBRARY AND MEDIA AREA

ACTIVITY	PERSON IN CHARGE	P- / C*	FISCAL YEAR 1995												FISCAL YEAR 1996												REMARKS
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
1) Dissemination of the information derived from the project (technical reports requiring mass distribution).	R.de la Barrera	P C																									Mass distribution is subjected to the needs and interest expressed by the several entities and organisms. For this reason, there is no program for 1996.
2) "Cuadernos de Investigación".	Dr. R. Meli R. Cicero	P C	• •		• •		• •			• •				• •				• •	• •		• •	-	•					For 1995, Publications: N° 22, 23, 24, 25 and 26. For 1996: 27, 28, 29, 30 and 31.
3) "Directory" - National and International addressees who receive the publications.	R. de la Barrera	P C									• •												•				Permanent Activity.
4) Collaboration in the publication and printing of proceedings.	R. Cicero V. Ramos	P C																									It is subjected to the organization of an academic act.
5) Development of bibliographic values and exchanges.	R. Cicero J. Díaz	P C	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	-	-	-	-	-	Permanent Activity.
6) Technical - informative videos on the activities developed by the structures and seismic instrumentation laboratories.	R. Cicero R. Boliver	P C															• •			• •							
7) Creation of a Mexico - Japan Dissemination Sub-committee.	R. Cicero																										Permanent activity with meetings every two months.
8) Creation of a Mexico - Japan Training (DRO), sub-committee.	T. Sánchez																										Permanent activity with meetings every two months.

Programed: P-
Carried out: C*

ANNEX VII.

LIST OF PUBLICATIONS ADDRESSED TO THE GENERAL PUBLIC

TRIPTYCHS	Year	Copies
THE SUN ECLIPSE	1991	5000
ACTIVE VOLCANOES OF MEXICO	1993	2000
VOLCANOES (POPOCATEPETL)	1994	10000
BROCHURES	**Year**	**Copies**
CLEAN AIR	1991	300000
CIVIL PROTECTION FAMILY PLAN: WHAT TO DO BEFORE, DURING AND AFTER AN EARTHQUAKE (CO-SPONSORED)	1991	10000
CIVIL PROTECTION FAMILY PLAN	1992 1993 1994 1995	25000 15000 50000 50000
WHAT TO DO IN CASE OF FLOODS?	1992 1993 1994 1995	10000 10000 25000 10000
WHAT TO DO IN CASE OF AN EARTHQUAKE?	1992 1993 1994 1995	10000 10000 25000 10000
WHAT TO DO IN CASE OF FIRES?	1992 1993 1994 1995	10000 10000 25000 10000
BE PREPARED FOR THE HURRICANE SEASON	1992 1994 1995	15000 5000 10000
VOLCANOES (POPOCATEPETL)	1994	10000

LIST OF PUBLICATIONS ADDRESSED TO THE PUBLIC INTERESTED IN THE SUBJECT

BROCHURES	Year	Copies
BASIC COURSE ON SINAPROC	1991	1000
INFORMATION ON LAGUNA VERDE	1990	3000
PERE AND ITS PROCEDURES	1990	3000
PRESENTATION OF CENAPRED SPANISH- -SPANISH- -ENGLISH-	1991 1995 1991	4000 10000 1500
1991 TRAINING PROGRAM 1992 1993 1994	1991 1992 1993 1994	1000 500 500 2000
CIVIL PROTECTION SIGNALING	1993 1994 1995	2000 5000 3000
CENAPRED	1996	3000
TRIPTYCH	**Year**	**Copies**
CENAPRED SPANISH- -ENGLISH-	1996 1996	3000 3000
PRACTICAL GUIDES	**Year**	**Copies**
EVACUATION DRILLS	1992 1993 1994 1995	1000 3000 6000 4000
COMMUNICATIONS FOR DISASTER PREVENTION	1992	1000
TEMPORAL REFUGES (SHELTERS)	1993 1994 1995	1000 6000 4000

REPORTS	Year	Copies
1990 RESEARCH ACTIVITIES 1991 1992 1993	1991 1992 1993 1994	500 300 500 500
"CUADERNOS DE CAPACITACION" (TRAINING BOOKS)	Year	Copies
INTRODUCTION TO THE LAGUNA VERDE CENTRAL (PROGRAMMED TEXT)	1994	1500
INTRODUCTION TO THE LAGUNA VERDE CENTRAL (PARTICIPANT MANUAL)	1994 1995	1500 1500
EXTERNAL RADIOLOGICAL EMERGENCY PLAN- PERE AND ITS PROCEDURES (PARTICIPANT MANUAL)	1995	1500
EQUIPMENTS AND VEHICLES DECONTAMINATION (PROGRAMMED TEXT)	1995	1500
RADIOLOGICAL PROTECTION FOR PERE RESPONSE STAFF	1995	1500
SCENARIOS AND DRILLS DESIGN	1995	1500
EXTERNAL RADIOLOGICAL EMERGENCY PLAN-PERE (SELF-LEARNING TEXT)	1995	1500

"PREVENCION" JOURNAL	Year	Copies
NO. 1	1992	3500
NO. 2	1992	3000
NO. 3	1992	3000
NO. 4	1992	3000
NO. 5	1993	4000
NO. 6	1993	3000
NO. 7	1993	4000
NO. 8	1994	6000
NO. 9	1994	6000
NO. 10	1994	6000
NO. 11	1995	4000
NO. 12	1996	4000
NO. 13	1996	4000
NO. 14	1996	4000
NO. 15 (IN PROCESS)	1996	4000

FASCICLES	Year	Copies
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HURRICANE (CO-SPONSORED) - SPANISH- -ENGLISH- -FRENCH-	1993 1993 1993	3000 3000 3000
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2ND COURSE FOR DIRECTORS RESPONSIBLE FOR WORKS	1994	300
3RD COURSE FOR DIRECTORS RESPONSIBLE FOR WORKS	1995	Text Published
4TH COURSE FOR DIRECTORS RESPONSIBLE FOR WORKS	1996	Text Published
THE POPOCATEPETL VOLCANO: STUDIES CARRIED OUT DURING THE 1994-1995 CRISIS	1995	300

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DESCRIPTION OF ASCII FILES GENERATED WITH THE DATA FROM THE SEISMIC OBSERVATION NETWORK OF CENAPRED: USER GUIDE	1990
DIAGNOSIS ON FLOODS OCCURRED IN THE MAIN BASINS OF THE MEXICAN REPUBLIC (HYDROLOGICAL REGIONS 8, 9, 10 AND 11)	1990
REGIONAL ANALYSIS FOR STATISTICALLY DEFINING THE MAXIMUM ANNUAL FLOW VOLUMES IN ZONES PRONE TO THE DIRECT INCIDENCE OF CYCLONES	1990
DYNAMIC BEHAVIOR OF SOILS AT THE BUILDING SITE FOR STEP II OF THE "LAZARO CARDENAS" IRON AND STEEL INDUSTRY, LAS TRUCHAS, MICH., MEX.	1990
ACCELEROGRAPHIC DATA PROCESSING SYSTEM OF CENAPRED: PROGRESS UNTIL NOVEMBER, 1990	1990
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RECORDS AT CENAPRED FROM SOME EXPLOSIONS OCCURRED AT THE QUARRY LOCATED IN FRONT OF ITS FACILITIES	1991
DESIGN AND CONSTRUCTION OF A VOLTAGE DOUBLE SOURCE FOR THE SEISMIC INSTRUMENTATION LABORATORY OF CENAPRED	1991
TECHNICAL REPORT OF THE FIELD TRIP TO THE CENTRAL-EASTERN PART OF THE MEXICAN VOLCANIC RING	1991
USE OF THE NHK SIGNAL AS A TIME REFERENCE FOR THE SMAC-MD ACCELEROGRAPHS OF THE SEISMIC NETWORK OF CENAPRED	1991
ZONING OF THE HYDROMETEOROLOGICAL CHARACTERISTICS OF THE "PAPALOAPAN" RIVER BASIN	1991
DESIGN AND CONSTRUCTION OF A CIRCUIT TO GENERATE THE NHK SIGNAL FOR GAUGING ACCELEROGRAPHS	1991
MEASURING OF THE NHK TIME SIGNAL DELAY	1991
DIAGNOSIS OF THE SEISMIC RISK FOR THE MEXICAN REPUBLIC AND EVALUATION OF INTENSITIES FOR HISTORIC EARTHQUAKES	1991
DIAGNOSIS ON FLOODS OCCURRED IN THE MAIN BASINS OF THE MEXICAN REPUBLIC (HYDROLOGICAL REGIONS 24 EAST, 34, 36 AND 37)	1991
APPLICATION OF THE RELIABLENESS THEORY TO THE DESIGN OF DETOUR WORKS	1991
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ANALYSIS OF SITE EFFECTS IN THE "PUERTO LIMON" AREA, COSTA RICA, USING DIGITAL SEISMOGRAMS	1992
GEOTECHNICAL ASPECTS OF THE TLALAMANCA, COSTA RICA EARTHQUAKE OCCURRED ON APRIL 22, 1991	1992
SEISMIC RESPONSE OF CONFINED MASONRY WALLS WITH DIFFERENT TYPES OF HORIZONTAL REINFORCEMENT	1992
OPERATIVE MANUAL OF THE RISK SCENARIO MAP FOR THE "FUEGO" VOLCANO AT COLIMA	1992
OPERATION MANUAL OF THE AX.EXE PROGRAM (ADJUSTMENT OF PROBABILITY DISTRIBUTION FUNCTIONS)	1992
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OPERATIVE MANUAL OF THE RISK SCENARIO MAP FOR THE "CEBORUCO" VOLCANO	1992
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TRANSPORTATION, DISPOSAL AND TOXICITY OF COMPONENTS WHICH MAKE A RESIDUE HAZARDOUS	1992
DIAGNOSIS ON FLOODS OCCURRED IN THE MAIN BASINS OF THE MEXICAN REPUBLIC (HYDROLOGICAL REGIONS 26 AND 27)	1992
SYSTEMATIC METHOD FOR CALCULATING THE FORM OF DESIGN FRESHETS AT DAMS WITH GREAT REGULATION CAPACITY	1992
DETERMINATION OF DRAINING COEFFICIENTS BASED ON THE CHARACTERISTICS OF BASINS	1992
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OPERATIVE MANUAL OF THE RISK SCENARIO MAP FOR THE "SAN MARTIN" VOLCANO AT TUXTLA	1993
TECHNICAL INFORMATIVE DOCUMENT ON HAZARDOUS RESIDUES HANDLING (SERIES I, HAZARDOUS RESIDUES HANDLING AND GENERATION)	1993
DEVELOPMENT OF A MODEL FOR PREDICTING FLOODS BASED ON RAIN DATA (SECOND PARTIAL REPORT)	1993
ZONING OF MAXIMUM ANNUAL FLOW VOLUMES IN SEVERAL HYDROLOGICAL REGIONS OF THE MEXICAN REPUBLIC	1993
RECORDS OF THE MAY 14, 1993 EARTHQUAKES OBTAINED BY THE SEISMIC OBSERVATION NETWORK OF CENAPRED (PART 1)	1993
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GENERAL VERIFICATION OF THE FUNCTIONING OF THE SIX PORTABLE WIDE BAND	1994

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SOLDERING WITH PRESSURE AND GAS	1996
MANUAL OF SOLDERING WITH PRESSURE AND GAS	1996
INTRODUCTION TO THE CODES OF CONSTRUCTION IN JAPAN	1996

Achievement of the Implementation plan

Narrative summary	Verification Indicator	Achievement	Important Assumptions
Overall Goal Earthquake Disaster Prevention in Mexico is promoted.	· Measures and regulations for earthquake disaster prevention based on National Civil Protection System	Building codes for Mexico City were improved and updated, which serve as a basic for other Mexican Cities.	Mexican policies with regard to earthquake disaster prevention continue
Project purpose CENAPRED functions as an organization executing investigations, training and disseminating activities	· Outputs of researches (reports) · The number of seminars held	-Improvements of the seismic observation networks and seismic safety of constructions. -Five courses for ORO one International course for Central America and the Caribbean Region.	The prevention of seisaic disaster continues to play an important role in Mexico Demand for training and dissemination activities from outside of CENAPRED continue to exist
Outputs 1. Researchers those people concerned with construction obtain and improve the knowledge in the field of earthquake resistant structure and strong motion earthquake observation. 2. ORO obtain and improve the knowledge on seismic engineering and earthquake resistance engineering. 3. Research outputs are disseminated among those who concerned with construction and information of disaster prevention is disseminated among people at large.	1-1. The number of research achievement related to earthquake resistant structures 1-2. The number of research achievement related to observation of strong ground motion earthquake 2-1. The number of technical materials for training activities 2-2. The number of seminar participants 3. The number of pamphlets and technical materials	1-1 10 research achievements. 1-2 8 research achievements. 2-1 Several materials for the six courses 3.- "Prevencion" Journal 15 Fascicles: 12 Proceedings: 20 Cuadernos de Investigacion": 50 Technical reports: 114. 40 Others (Pamphlets Brochures, posters, etc.): 34	Mexican counterpart personnel continue working at CENAPRED Technicians from Central America and the Caribbean Region participate in CENAPRED activities
Activities 1-1. Carry out researches related to earthquake resistant structures a) installation of testing system b) computer on-line test c) full scale test of confined masonry structure d) earthquake resistant repairing and strengthening e) standard for evaluating damaged buildings f) gas pressure welding of steel bar 1-2. Carry out researches related to seismic observation a) observation of strong ground motion b) broad-band seismograph c) network system of strong ground motion seismograph d) maintenance of seismograph networks e) seismic mechanisms and wave propagation f) development of strong ground motion database g) microzoning 2-1. Prepare technical materials for training 2-2. Hold seminars 3. Publish pamphlets and other technical materials related to the research output	Input Japanese side project-type technical cooperation long-term experts 22 short-term experts 85 provision of machinery and equipment 217 (Mil. Yen). acceptance of counterparts 23 grant construction of the center and provision of machinery and equipment 1,246 (Mil. Yen) Mexican side budget for the project allocation of counterparts area of CENAPRED 15,000 m²		Pre-Condition The characteristics and position of CENAPRED in the Mexican Government do not change after the conclusion of R/D

8. EVALUATION OF THE ACTIVITITIES MENTIONED IN THE R/D ATTACHED DOCUMENTS

Activivities mentioned in the R/D attached documents	Evaluation	Notes
I. GENERALITIES		
1. Modification of CENAPRED's structure		
1) Important structural changes.	A	Refer to 2.2
2) Establishment of a Techanical Secretariat.	A	Refer to 2.2
3) Encouragement of joint activities involving people from every division.	B	This is a purpose in the activities from the technical Secretariat.
4) Promotion of the participation of the research personnel in training, dissemination, etc., activities.	A	Refer to 2.2.4
2. Elaboration of the annual activity programs and budgets		
1) Programation of the annual activity programs and budgets.	A	
2) Notification of the authorized programs and budgets and their modifications to the personnel in charge of performing them.	A	
3. Improvement of salary conditions of researchers		
1) Updating of the salary system in accordance with the academic level changes of researchers.	B	The generalized economic problems of the country have made it difficult to make changes.
2) Equalization of their salaries and those of the academic personal in UNAM.	B	CENAPRED depends on the Ministry of the Interior and secondly the relationship with UNAM is also very important.
3) Establishment of an evaluation-based repayment mechanism.	B	This situation depends from the economic recuperation of the country.
4) Evaluation of their participation in technical support activities for the National Civil Protection System.	A	

* A = Totally Complete. B = Partially Complete. C = Not Complete.

4. Optimum use of the academic posts authorized for the researchers of CENAPRED		
Activities mentioned in the R/D attached documents	Evaluation	Notes
1) Improvement of the academic level of those posts with full-time postgraduate and doctorate researchers.	A	
5. Upgrading the academic level of the technical personnel		
1) Opportunities for CENAPRED's personnel to achieve higher academic degrees through postgraduate courses given at UNAM	A	
2) Support for the researchers to attend technical-Scientific congresses, workshops, symposia and courses in Mexico and abroad	A	
3) Definition of independent work programs for every researcher	B	In some especific cases this has been posible.
6. Optimum use of facilities and equipments		
1) Elaboration of practical operation manuals	B	In process of elaboration.
2) Assignation of full-time persons to operate the MTS actuator system	A	The person in charge is Dr. Oscar López Batiz.
3) Preparation of annual programs for the maintenance and timely replacement of equipments	B	The programs exist but they must be more complets.
4) Preventive and corrective maintenance contracts for the computer equipments	A	
7. Research aimed at solving meaningful problems throughout Latin America		
1) Collaboration to Latin America institutions	B	In process of establishment.
8. Transferring of technologies to the professional technical milieu		
1) Establishment of training programs on updating courses for practice engineers.	A	

* A = Totally Complete. B = Partially Complete. C = Not Complete.

9. Increase in CENAPRED's projection towards the Countries of Central America and the Caribbean Region		
Activities mentioned in the R/D attached documents	Evaluation	Notes
1) Activity program based on the results of the surveys made in Guatemala, El Salvador, Honduras and Costa Rica	B	Activities developed in El Salvador and Nicaragua.
II. RESEARCH ACTIVITIES		
1. Seismic Instrumentation Area		
1) Continuous operation, maintenance and modernization of the seismic observation networks.	A	
2) Improvement of the telemetry system of the seismic observation networks	B	The telemetry system are in operation but the networks must grown.
3) Monthly visits to the stations of the seismic observation networks	A	
4) Publication of accelerographic records of 1990, 1991 and 1992 as "Cuadernos de Investigación"	A	
5) Publication of "CENAPRED's Seismic Observation Manual of CENAPRED's Seismic Observation System of Strong Ground Motions"	B	This work is permanent along the time.
6) Installation of additional equipments at Station N.15 IMP	A	
7) Development of a computer program which allows periodical and automatic interrogation between CENAPRED and the accelerographic stations of Mexico City.	A	
8) Improvement of communication between CENAPRED and Chilpancingo, Mezcala, Acapulco and Cuernavaca stations.	B	The limitation is economic.
9) Field studies with the broad-band instruments	B	The use of this equipment has been limited.
10) Development of a system for constant updating CENAPRED's database of strong ground motion.	A	

* A = Totally Complete. B = Partially Complete. C = Not Complete.

Activities mentioned in the R/D attached documents	Evaluation	Note
11) Establishment of a telemetric network for the observation and monitoring stations to know the seismic activity of the "Popocatépetl" Volcano.	A	This activity is not a part of the joint Project and is carried out with Mexican resources.
12) Consideration of installing seismological stations for other active volcanoes in Mexico.	B	This activity is not a part of the joint Project.
2. Geological Hazards Area		
1) Preparation of a database and Geographical Information System (GISs) for the seismic hazard in urban areas.	A	
a) Completion of databases of Mexico City and of Colima City.	A	Database for Mexico City is being improved with new geographical data. Colima vulnerability functions are being revised due to recent earthquakes at the Western coast.
b) Publication of the results of this study as "Cuadernos de Investigación"	A	Three volumes are finished (D.F., Colima and SRO).
c) Development of a computer software for the GISs	A	Software needs minor adjustements for new O.S.
2) Extension of the database on macroseismic intensity.		
a. Creation of isoseismal maps including the data of major historic earthquakes.	A	
b. Preparation of the nation- wide database on earthquake disasters in terms of spectral ordinates.	A	Finished in the form of a computer system.
3) Research on the mechanism of the seismic source in the Pacific coast.		
a) Research on the interplate mechanism on the Pacific Coast.	A	The analysis of two recent earthquakes is almost finished.*
b) Calculation of synthetic seismograms.	A	
c) Estimation of focal parameters of future earthquakes.	A	*

* A = Totally Complete. B = Partially Complete. C = Not Complete.

Activities in the R/D attached documents	Evaluation	Notes
4) Research on site effects		
a) Development of guidelines for research groups in Mexico to evaluate site effects.	A	Microzoning for Colima City has been published in a C.I. Data from Cd. Guzman is under analysis
5) Use of a portable seismic observation system		
a) Selection of a new building with a simple shape and installation of a portable seismic observation system in the selected building.	A	The instrumentation has been set up in the building and seismic data due to recent earthquakes is under analysis.
b) Publication of the obtained data as "Cuadernos de Investigación".	B	Internal reports heve been generated in the future they cuold be published as a C.I.
6) Development of models of volcanic hazards		
a) Development of volcanic hazard computer models for the most hazardous volcanoes in Mexico.	A	
3. Seismic Testing Area		
1) Confined masonry structures		
a) Edition of the final report on the tridimensional model.	A	
b) Edition of the final report on the horizontal strengthening models.	A	
c) Design of craftsman-made brick walls with mesh.	A	
d) Construction of walls.	A	
e) Testing of models.	A	
f) Design of extruded brick walls.	A	
g) Construction of models.	A	
h) Testing of models.	B	In process.
i) Analysis of results.	B	In process.
j) Edition of reports and practical recommendations	B	In process.

* A = Totally Complete. B = Partially Complete. C = Not Complete.

Activities mentioned in the R/D attached documents	Evaluation	Notes
2) Pseudo-dynamic testing system.		
a) Calibration of the MTS system.	A	
b) Gauging of the system for the 50 ton actuators and then for the 100 ton actuators.	A	
c. Preparation of the devices and pressure gauges for the energy dissipaters project.	A	
d. Pseudo- dynamic tests	B	In process of preparation.
3) Building strengthening techniques.		
a) Database of rehabilitated buildings.	A	
b) Selection of typical buildings.	A	
c) Evaluation of selected buildings.	B	In process of preparation.
d) Post-seismic evaluation of selected building.	B	In process of preparation.
4) Instrumentation to observe the behavior of building foundation	A	
III. TRAINING		
1. Technical Courses		
1) Carrying out the Course on Seismic Safety of Constructions for "Directores Responsables de Obra (D.R.O.)", twice a year.	A	
2) International Course on Seismic Safety of Constructions for Central America and the Caribean Region.	A	
3) Establishment of a "Diplomado" Course on Disaster Prevention and Civil Protection Programs Management.	A	
2.Design and elaboration of didactic and supportive material for technical and civil protection courses.		

* A = Totally Complete. B = Partially Complete. C = Not Complete.

Activities mentioned in the R/D attached documents	Evaluation	Notes
3. Support to CENAPRED's Research Coordination		
1) Initiation of a project to evaluate the Gas and Pressure Welding Technique.	B	Training of Mexican technicians remains pendant since CENAPRED does not have a person who knows how to use ultrasonic technique for inspection.
4. External Support		
1) Collaboration with instituitions or groups which request support.	A	
IV. DISSEMINATION		
1. Mexico-Japan Dissemination Sub-committee		
1) Creation of the Sub-committee.	A	
2) Selection of technical reports that may require a massive distribution.	B	The distribution must be selected and actually there is an apropriate directory.
2. " Cuadernos de Investigación" series		
1) Establishment of a program for publications selected.	A	
2) Elaboration of a directory of organizations and persons to whom publications will be sent to inside and outside Mexico.	B	The directory exist but it can be completed.
3. Collection of information		
1) Collection of technical materials and publications.	A	
2) Encouragement for the exchange of publications with other institutions.	B	In process of establish more contacts.
4. Technical- informative videos		
1) Production of technical-informative videos.	B	In process.

* A = Totally Complete. B = Partially Complete. C = Not Complete.

FUTURE TASKS

PROPOSED BY CENAPRED

FUTURE TASKS

1. Future tasks after the end of the Cooperation Project

Future tasks after March, 1997, are detailed for each area as follows.

1-1. Seismic Instrumentation Area

1) Operation and improvement of the seismic network

Operation and maintenance of the network, as well as data processing and dissemination of strong motion information, will be given priority and will continue at the same present level. In addition, we will continue giving support and working closely with other research groups within CENAPRED, which are related to seismic instrumentation. These include instrumentation of buildings with the new portable accelerograph networks and research with the network of portable broadband seismographs.

To improve the present strong motion network, in 1996 we started replacing some of the original SMAC-MD instruments by state-of-the-art 19 bit accelerographs. Depending on the support and available resources, in the coming years we will progressively continue updating and modernizing the rest of the older accelerographs (SMAC-MD) located in Mexico City. In the meantime we will use the replaced instruments as spare parts.

Another project would be the improvement of communications between the remote field stations and CENAPRED. Higher speed modems with compression and error correcting schemes will be tested to make the interrogation process through conventional switched telephone lines more efficient. For the three stations along the Acapulco-Mexico line which are not linked yet to CENAPRED, direct satellite communication is being considered. First, a pilot station will be established to evaluate this new media. Based on the results, the other two stations will be conditioned. Regarding the 8 accelerographs recently installed at the IMP building, a local network will be established to allow remote interrogation of each individual unit through a single communication line to CENAPRED.

One important project which we will push forward is the development of a completely automated seismic detection, data retrieval and processing system which upon the occurrence of a major earthquake will autonomously interrogate each station, collect recorded data and process it providing accelerogram plots for each triggered station. Under normal circumstances, it will supervise the system and report any anomaly of the network.

Finally, the project to develop an early intensity estimation system for Mexico City will be completed.

2) Data processing and information dissemination

With the updated new strong motion instrumentation mentioned above, and a more efficient communication scheme, more and better data is expected in the future. Therefore it would be also convenient to revise and update the different data processing programs and procedures in order to automate these routines as far as possible and make the process more efficient. This would imply new software development and reinforcement of the present computer systems and networks.

Yearly reports on recorded and processed data will be published. In case of a major earthquake, immediate preliminary reports will be prepared. Other publications on research and development projects related to the instrumentation will be also produced.

3) Strong motion database system

As part of an interinstitutional project, the Mexican Strong Motion Database will continue being further developed. The huge amount of information (more than 8500 three-component accelerograms from over 1200 earthquakes) collected since 1960 in Mexico on instrumentation and strong motion records will be progressively made available to users through several CD-ROMS and Internet. All data will be translated into the standardized self-contained format established. CENAPRED will continue to participating and supporting this effort together with other main research institutions in the country.

4) Volcanic instrumentation and monitoring

This new area of CENAPRED has been responsible for instrumenting and monitoring the Popocatepetl volcano which became active in December, 1994. Reinforcement of this monitoring system in various aspects and also the instrumentation of other Mexican active volcanoes, will be implemented in the future. For these projects collaboration with other institutions will be promoted.

5) Technical events

We will continue participating in seminars, conferences and technical meetings related to strong motion instrumentation, data processing and volcano monitoring systems. A proposal has been made to organize in the near future an International Seminar on "Seismic Observation Networks and Data Processing Systems" with the main scope to promote the exchange of information and experiences, as well as interaction among similar research institutions mainly in the Latin-American area.

1-2. Geological Hazard Area

In addition to the basic activities in the area, the staff of the Geological Hazards Area achieves supports activities for the National Civil Protection System.

It would be highly desirable to continue and expand cooperative projects in all the areas of research.

Particularly in the Geological Hazards Area, cooperative lines of research may be proposed in surveying areas affected by earthquakes, generation of isoseismal maps, volcanic hazard assessment, volcano monitoring, and in general, all aspects of geological risk evaluation, surveillance and mapping.

1-3. Seismic Testing Area

Main activities proposed

1. Standards for Evaluation and Guidelines for Rehabilitation of Masonry Structures

A simple evaluation method for assessing the structural safety of rural housing will be developed. This methodology will serve for implementing vulnerability reduction programs in towns of Mexico. A series of pamphlets must be developed to teach the population in the countryside what an earthquake is, its consequences and typical damage patterns observed, and how masonry structures can be strengthened at low costs. Information from testing programs in Mexico, Peru and elsewhere will be assessed. Typical characteristics of adobe and masonry houses in the rural areas will be studied.

2. Standards for Evaluation of Seismic Performance

To assess the vulnerability of substandard structures, guidelines for evaluation of seismic performance must be developed. This methodology will serve for implementing vulnerability reduction programs in cities of Mexico, which will provide insight for establishing priorities for rehabilitation of structures. The guidelines must cover reinforced concrete and steel structures.

3. Guidelines for Building Rehabilitation

It is necessary to develop guidelines applicable for repairing and strengthening buildings. Such guidelines must incorporate those concepts and analysis and design criteria used for new building construction pertaining to the problem. Different techniques were applied in Mexico City, thus making this metropolis the largest laboratory of rehabilitated structures in the world. To better understand the behavior of rehabilitated buildings it is necessary to instrument structures that were rehabilitated with typical schemes (concrete/steel jacketing, cable bracing, structural walls). Structural drawings of rehabilitated buildings will be available from Mexican consulting engineers.

Other projects proposed

1. Study on Energy Dissipation Devices

The performance of energy dissipation devices through a series of experiments in laboratory will be assessed. Based on the results, analytical studies will be undertaken to further knowledge on structural response with such devices. The applicability of the devices developed for building upgrading will be also evaluated.

2. Confined Masonry Construction

In accordance with a study conducted at CENAPRED, the second and third type of masonry unit in low-cost housing is industrialized clay brick and concrete block. Since these units are used in structures in regions of different seismic risk in the country, it is advisable to re-assess their performance by using toady's materials. Methods for improving wall behavior under lateral loads must be evaluated experimentally.

3. Precast Concrete Structures for Housing

Although average labor costs are still lower than construction material costs, the present trend of growth of Mexican cities is in building height and not so much plan-wise. To attain the construction of mid-rise and high-rise buildings for housing, an industrialized construction system seems obvious to be used. Precast concrete construction offers the advantages looked for in this type of construction: concrete is cheaper in Mexico than structural steel shapes, precast concrete girders (typically used for bridge construction in Mexico) are built satisfying international quality control standards, thus, precast concrete elements can be easily and well-manufactured in Mexico.

There are no specific design guidelines for precast construction in Mexico. Guidelines from other countries will serve as example.

4. Feasibility Study for the use of high-performance Concrete in Mexico

The use and development of high-performance concrete in Mexico will be evaluated. The applicability of outside research in Mexican engineering practice will be reviewed. Conclusions are aimed at being incorporated in future code revisions.

1-4. Training Department

Generally speaking, the Training Area which isintegrated by the Civil Protection, Technical Training and PERE Areas, will continue carrying out the courses, activities and established commitments described in this document. The activity program after 1997, will be focused on solving training requests by SINAPROC by means of the, carryingout and coordination of courses related to the technical aspects of disaster prevention, and the operative and normative aspects of civil protection.

Specifically, the technical training area will continue working in the following aspects:

1. Realization of Courses on Seismic Safety of Building Constructions.
2. Introduction to the performance and inspection of the GPW Technique in Mexico, and establishment of training courses.
3. Implementation of a training program for third countries with special attention to Central America and the Caribbean Region on topics related to earthquake disaster prevention, structural safety and civil protection.
4. Offering national and international supports by means of courses and conferences to institutions interested in CENAPRED activities.

It is clear that activities 1 to 3 (where JICA's support has been very important) will need a continuous budget assignment. Also, it must be considered that countries from Central America and the Caribbean Region have economic limitations to finance a scholarship program for training, by themselves. Thus, it is required to look for alternating sources of financing and to internationally promote the technical training carried out in Mexico.

1-5. Dissemination Department

In order to consolidate the support received from the Japanese side and according to the functions conferred to this Center, the activity program to be carried out by the Dissemination Department after the termination of the extension project, includes -among other aspects- the following activities:

-To increase the copies of publications, as well as the number of addressees.
-To propose collaboration and exchange agreements to related or complementary institutions at the national and international levels.
-To promote events or academic acts in order to encourage the transference of technologies and knowledge between national and international institutions and CENAPRED.
-To include the information heap of CENAPRED in the world communication networks, seeking that this Center acts as a focal point for Central America and the Caribbean Region.
-To maintain, as much as possible, communication with this Area's Japanese side, for a mutual and profitable development of activities.

2. Third Country Training and Counterpart Training as Post-project Cooperation

Third country training, which JICA, the organizer of the present project, is trying to realize from fiscal year 1997, is one of the programs as the continuation of the cooperation between CENAPRED and Japan after the project ends. CENAPRED has agreed with this training program, since it has already launched similar supporting programs for nearby countries on its own. This training is planned to be carried out for several years focusing on earthquake disaster prevention. During this period, Japanese cooperation, such as dispatch of short-term experts, will be continued.

On the other hand, Mexican counterpart training in Japan will be also initiated by JICA from fiscal year 1997 in order to keep up the achievements obtained through the present project. This is another program for the post-project cooperation between CENAPRED and Japan.

3. Plan of future activities partially completed in the R/D document from 1994

About research equipment we consider that the Center have the enough resources as for concluded successfully the compromised works and only it's neccessary to take care with the regular corrective and preventive maintenance.

The hardware which CENAPRED have in a high percentage must be elevated or substituted with equipment o better technology which permit do more efficient the administrative and technical processes.

In the field of administrative human resources CENAPRED has the correct number of people in relation with it's necessities.
In other hand, the research human resources are provided from the National Autonomus University of Mexico through an agreement of collaboration which consider equitable categories of spécialization, according with economic recuperation of the country, CENAPRED will try to elevate the salaries of the researchers with the support of the Ministry of Interior.

Considering the above described, the finish of each very specific compromised work will be completed.

Finally, the end of the JICA-CENAPRED Project needs to establish a mechanism that allows the continuous and permanent exchange of information between the staff of CENAPRED (mainly researchers) and other related institutions of Japan, which carry out academic activities and similar research programs.

4. Financial sustainability

Regarding the conformation of the budget, the Creation Decree establishes that the resources for operating CENAPRED will be integrated by: the budget assigned by the Federal Government; the contributions received and that may derive from agreements or settlements signed with Federal branch offices and organization, social and private institution, as well as with international organizations and governments from other countries; and additional incomes or assets acquired by the Center through other legal means.

CENAPRED elaborates a budgetary plan based on a general estimation of needs to execute its annual work program, without specifying a correspondence between a goal and a resource (particularly in the case of research). The procedure CENAPRED, as worked with until now, has not caused any budgetary insufficiency to support all the activities carried out to executed its objectives.

The restrictions of the Federal Goverment to acquire equipment cannot be ignored. CENAPRED was not unaware of the hard economic politics for the public sector, which characterize at the final period of each six-year governing period (In Mexico the President stay in this position along 6 years) and which were some of the measures implemented to reduce public finances.

Nevertheless, facing the need of arranging for certain restricted acquisitions, the Federal Public Administration is flexible when the goods requested are fully justified. The best example in the regard is the recent authorization to acquire the necessary equipment for the installation of the seismic monitoring network at the Popocatepetl Volcano.

For this reason and for the importance CENAPRED has gained, the budgets requested by the Center to implement its annual work programs will be authorized without any problems, towards the desired self-sufficiency.

There is no detailed program for maintaining the equipment in general. The budgetary sufficiency is based on a general calculation, considering the experience of former years.

Further budget can be obtained from:

- Japan International Cooperation Agency (JICA)
- United Nations.
- Research Programs with private companies from Mexico
- Sell of publications, videos and material of civil protection.
- Research programs with public and private institutions from U.S.A., Costa Rica, Chile, Italy, etc.

2 討議議事録（当初R／D）（英文）

RECORD OF DISCUSSIONS BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM AS REPRESENTATIVE OF THE JAPANESE GOVERNMENT AND THE NATIONAL DISASTER PREVENTION CENTER AS REPRESENTATIVE OF THE MEXICAN GOVERNMENT, ON THE JAPANESE TECHNICAL COOPERATION FOR THE EARTHQUAKE DISASTER PREVENTION PROJECT IN THE UNITED STATES OF MEXICO

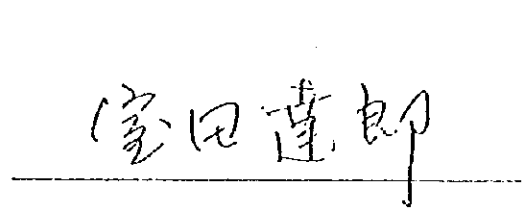
The Japanese Implementation Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Fumio Endo, visited the United States of Mexico from February 18 to March 2, 1990, for the purpose of working out the details of the technical cooperation Project concerning the earthquake disaster prevention in the United States of Mexico (hereinafter referred to as "the Project").

During its stay in the United States of Mexico, the Team exchanged views and had a series of discussions with the representative of the Mexican authorities concerned, headed by Lic. Salvador Pomar Fernández, Director General of the National Disaster Prevention Center (hereinafter referred to as "CENAPRED"), in respect of the desirable measures to be taken by both governments for a successful implementation of the Project.

As a result of the discussions and in accordance with the provisions of the Agreement on Technical Cooperation between the Government of Japan and the Government of the United States of Mexico signed in Tokyo on December 2, 1986 (hereinafter referred to as "the Agreement"), both parties agreed to recommend to their respective governments the matters referred to in the documents attached hereto.

Both English and Spanish texts of this Record of Discussions and its attached documents are equally authentic.

Mexico, D.F., March 1, 1990.



For Mr. Fumio Endo
Leader, Implementation Survey Team,
Japan International Cooperation
Agency, Japan.

Lic. Salvador Pomar Fernández
Director General, National Disaster
Prevention Center, the United States
of Mexico.

ATTACHMENT

I . COOPERATION BETWEEN THE GOVERNMENTS

The Government of Japan and the Government of the United States of Mexico will cooperate with each other in implementing the Project in accordance with the bases established in the Master Plan of the Annex.

II . MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan, and the provision of Article III of the Agreement, the Government of Japan will take, at its own expense, the following measures through JICA according to the normal procedures of its technical cooperation scheme:

1. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will dispatch the Japanese experts listed in II of the Annex. The provisions of Articles V, VI and VII of the Agreement will apply to the above-mentioned experts.

Based on the Mexican request, the Government of Japan will prepare necessary measures to take charge of expense related to the provisions of Article V (c)-i,ii and (d).

2. PROVISION OF MACHINERY AND EQUIPMENT

The Government of Japan will provide a small quantity of equipment (hereinafter referred to as "the Equipment") necessary for the implementation of the Project to supplement such machinery, equipment and other materials as provided by the Grant Aid Program.
The provision of Article VIII of the Agreement will apply to the equipment.

3. TRAINING OF MEXICAN PERSONNEL IN JAPAN

In accordance with the provision of Article III-(a) of the Agreement, the Government of Japan will accept the Mexican personnel connected with the Project for their training in Japan. The provision of Article IV of the Agreement will apply to the above-mentioned personnel.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE UNITED STATES OF MEXICO

In accordance with the laws and regulations in force in the United States of Mexico, the Government of the United States of Mexico through CENAPRED will take, at its own expense, the following measures:

1. MEXICAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

In accordance with the provision of Article V-(b) of the Agreement, the Government of the United States of Mexico designates CENAPRED as the organization responsible for the implementation of the Project, which will secure services of suitably qualified Mexican counterpart and administrative personnel listed in III of the Annex.

2. PROVISION OF LAND, BUILDINGS AND INCIDENTAL FACILITIES

In accordance with the provision of Article V-(a) of the Agreement, the Government of the United States of Mexico will provide such land, buildings and incidental facilities as listed in IV of the Annex.

3. SUPPLY AND REPLACEMENT OF EQUIPMENT AND MACHINERY

CENAPRED will supply and/or replace equipment, machinery, vehicles, instruments, tools, spare parts and other materials necessary for the implementation of the Project, in accordance with the Annual Activity Program of the Project approved by the Joint Committee (mentioned below in IV. 3 of this document).

4. ALL RUNNING EXPENSES

The Government of the United States of Mexico will meet all running expenses necessary for the implementation of the Project.

IV. PROJECT ADMINISTRATION

Administration of the Project will be as follows:

1. DIRECTOR GENERAL OF CENAPRED

The Director General of CENAPRED of the Ministry of Interior will bear overall responsibility for the implementation and organization of the Project.

2. CONTRIBUTION OF JAPANESE EXPERTS

1) The Japanese Chief Advisor will provide necessary recommendations and advice on technical and administrative matters concerning the implementation of the Project to the Director General of CENAPRED.

2) The Japanese experts will collaborate in the research, training and dissemination joint activities to be agreed by both parties and which are stated in the Activity Program of the Project, and will also give necessary technical guidance and advice to the technical personnel of CENAPRED for the best implementation of the Project

3. JOINT COMMITTEE

For effective and successful implementation of the Project, a Joint Committee will be established with the functions and composition as referred to in V of the Annex.

4. ORGANIZATION CHART

The Project will be administered in accordance with the organization chart which is given in Ⅵ of the Annex.

5. MUTUAL CONSULTATION

There will be mutual consultations between the representatives of the two governments on any major issues arising from, or in connection with this document.

6. PROJECT ACTIVITY PROGRAM

The Project activities will be developed according to the Annual Activity Program of the Project established by the Joint Committee.

The duration of technical cooperation for the Project will be of five (5) years from April 1, 1990.

ANNEX

I. MASTER PLAN

1. Objectives of the Project

The objectives of the Project are to study, develop and improve systematically technologies and techniques on earthquake disaster prevention and mitigation, through joint activities of research, training and dissemination in CENAPRED of the United States of Mexico, thereby contributing to the development of the appropriate prevention measures in the United States of Mexico, Central America and the Caribbean region.

2. Contents of the Japanese Technical Cooperation

To assist, advise and collaborate with CENAPRED in carrying out the activities as referred to in the following item 3. with the dispatch of Japanese experts, training of Mexican counterpart personnel in Japan, and provision of machinery and equipment.

3. Scope of Work of the Japanese Technical Cooperation Program

1) Technology Development

To carry out research joint activities and to transfer basic and applied technologies and techniques related to the following research items:

i- Earthquake generation mechanisms and attenuation laws of ground motions;
ii- Influence of local soil conditions on earthquake ground motion and soil-structure interaction during earthquakes;
iii- Earthquake risk studies and microzonation;
iv- Evaluation of static and dynamic seismic performance of building structures in the United States of Mexico, Central America and the Caribbean countries, through analytic and experimental techniques.

v- Contribution to the development of technical standards for design and construction of earthquake-resistant buildings.

2) Training Program

To assist and advise Mexican counterpart personnel in conducting the following activities:

i- Preparation of training curriculum;
ii- Preparation of technical materials for training;
iii- Training of instructors.

3) Dissemination

i- Dispatch of experts to seminars, if necessary;
ii- Provision of Japanese publications and thesis on earthquake disaster prevention and mitigation in Japan for their distribution in the United States of Mexico and other countries;
iii- Advice to Mexican counterpart personnel in the elaboration of the dessemination material oriented to technicians, professionals and the public;
iv- Organization of international academic events.

II. JAPANESE EXPERTS

1. Chief Advisor

2. Coordinator

3. Experts in the following fields:

1) Evaluation of strong ground motions;
2) Earthquake-resistant structures and experimental techniques for the evaluation of building seismic performance;

3) Design, construction procedures and standards of earthquake-resistant buildings.

4. Short-term experts may be dispatched when necessity arises, for the the smooth implementation of the Project in accordance with the Annual Activity Program of the Project.

Note: Japanese experts will commit themselves to participate in research activities and to transfer their know-how to Mexican counterparts, and they may give lectures or conferences to trainees, if their participation in the training and dissemination program is agreed beforehand by both parties.

III. MEXICAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Director General of CENAPRED with overall responsibility of the Project.

2. Research, Training and Information Coordinators with the responsibility for the implementation of the activities in their respective areas.

3. Counterpart personnel in the fields of:

(1) Evaluation of strong ground motions;
(2) Earthquake-resistant structures and experimental techniques for the evaluation of seismic performance in buildings;
(3) Training and Dissemination;
(4) Other aspects in seismology and seismic engineering related to the Project activities.

4. Personnel for the administration and implementation of the Project:

(1) Administration staff
(2) Staff for maintenance of buildings and facilities
(3) Staff for maintenance and operation of the equipment
(4) Other necessary supporting staff as agreed by both sides.

Ⅳ. LAND, BUILDINGS AND FACILITIES

CENAPRED will provide the following items for the Project:

1. Land, buildings and facilities necessary for the implementation of the Earthquake Disaster Prevention Project;

2. Office space, furniture and office basic equipment necessary for the activities of the Japanese Chief Advisor, coordinator and other experts.

Ⅴ. JOINT COMMITTEE

1. Function

The Joint Committee will meet regularly once a month and when necessity arises:

1) To formulate the Annual Activity Program of the Project based on the Tentative Schedule for the Implementation of the Project, formulated under the framework of the Record of Discussions and given in Ⅶ. 2 of the present Annex;

2) To review the overall progress of the technical cooperation program as well as the achievements of the above-mentioned Annual Activity Program of the Project;

3) To review and exchange views on major issues arising from or in connection with the technical cooperation program and;

4) To determine all the details required for the smooth and effective implementation of the Project.

2. Composition

The Committee members wil be:

1) Director General of CENAPRED, who will function as Co-chairman

2) Chief Advisor of Japanese experts, who will also function as Co-chairman

3) Coordinators, heads of the Geological Risk, Seismic Instrumentation and Seismic Testing Areas, and the Technical Advisor of the Director General of CENAPRED on the Mexican side.

4) Japanese Coordinator and Experts as well as a Representative of JICA Mexico Office on the Japanese side.

Note 1: Official(s) of the Embassy of Japan may attend the Committee sessions as observer(s).

Note 2: Attendance of observer(s) of third institutions can be requested by the Committee, if necessary.

VI. ORGANIZATION CHART

(See attached Charts 1 and 2 of this Annex)

VII. PROJECT ACTIVITY PROGRAM

1. Annual Activiy Program of the Project

In accordance with the Tentative Schedule for the Implementation of the Project, the Joint Committee will determine the Annual Activity Program of the Project that will establish the goals, concrete activities and human resources and materials to be assigned to the Project in the corresponding period.

2. Tentative Schedule for the Implementation of the Project

The Tentative Schedule for the Implementation of the Project is given in Chart 3 of the present Annex. The chart has been formulated on the

condition that the necessary budget will be allocated for the implementation of the Project, and that the Schedule is subject to change within the framework of the Record of Discussions, whenever necessity arises in the course of the Project implementation.

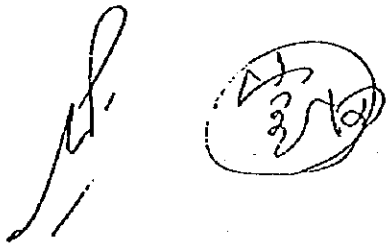


CHART 1

ORGANIZATION CHART

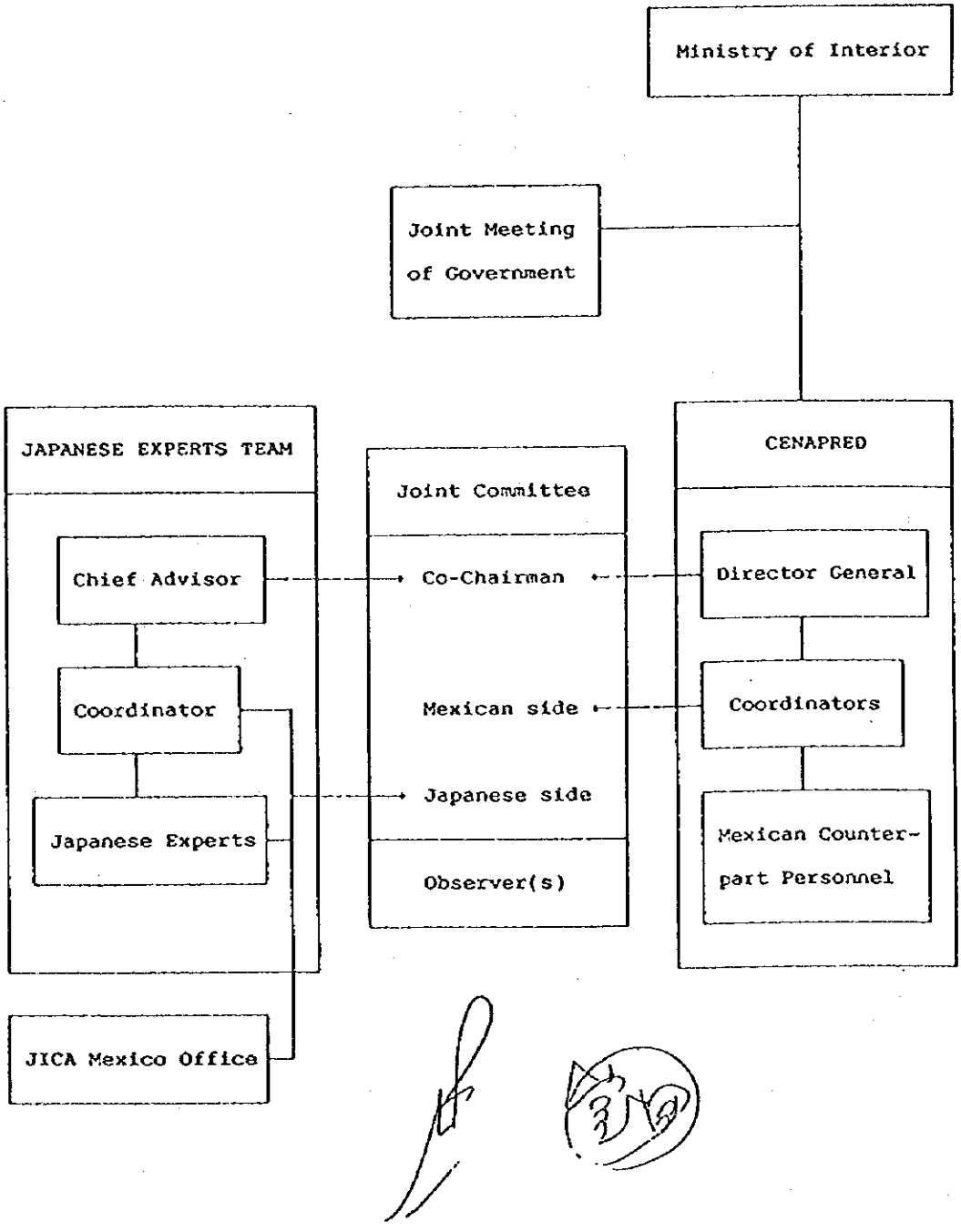


CHART 2

ORGANIZATION OF CENAPRED

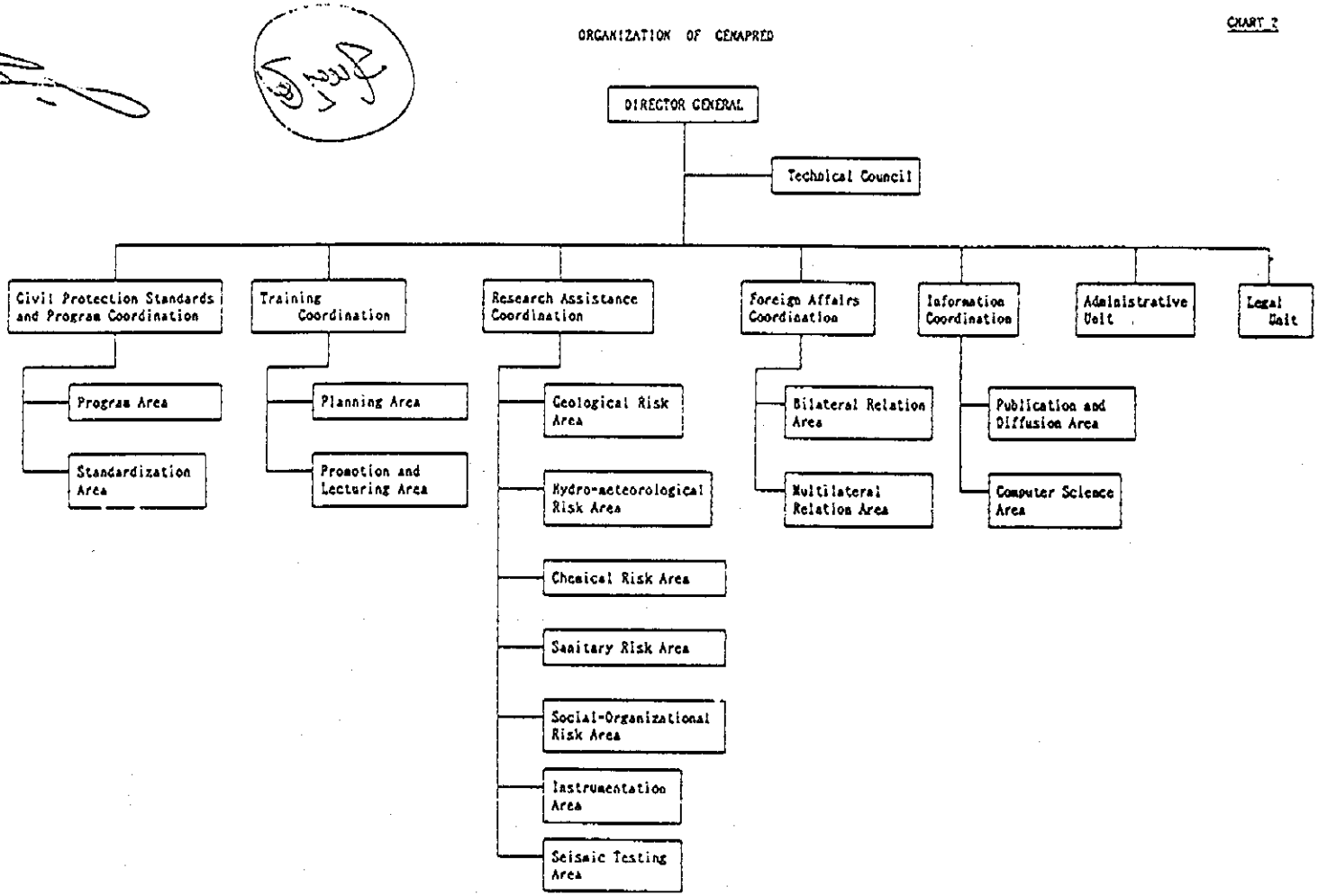


CHART 3

TENTATIVE SCHEDULE FOR THE IMPLEMENTATION OF THE PROJECT

C. Year / Item	1990	1991	1992	1993	1994	1995
DURATION OF PROJECT	←					→
MEXICAN ACT.						
1. Provision of Staff	←					→
2. Procedure of Receiving Equipsent Provided by JICA	←					→
3. Technology Development:						
1) Seisaic Risk and Micro-zonation	←					→
2) Seisaic Testing and Earthquake-Resistant Design	←					→
3) Evaluation of strong ground motions	←					→
4. Training Activity	←					→
5. Dissemination Activity and Seminar	←					→
JAPANESE ACT.						
1. Dispatch of Japanese Experts						
Long Term Experts						
1) Chief advisor	←					→
2) Coordinator	←					→
3) Evaluation of strong ground motions	←		→		←	→
4) Earthquake-resistant structure	←					→
5) Design, construction procedures and standard	←					→
Short Term Experts						
(An appropriate number may be dispatched, when necessity arises)						
2. Training of Mexican Staff in Japan	←	→	←	→	←	→
3. Supply of Equipment (Small quantity of equipment will be provide under the Technical Cooperation Scheme)	←					→
4. Dispatch of Survey Teams:						
R/D Teas						
Evaluation Teas						
Others						

3 ミニッツ (英文)

MINUTES OF MEETING BETWEEN THE JAPANESE TEAM AS REPRESENTATIVE OF THE JAPANESE GOVERNMENT, AND THE NATIONAL DISASTER PREVENTION CENTER AS REPRESENTATIVE OF THE MEXICAN GOVERNMENT CONCERNED, ON THE IMPLEMENTATION OF THE JAPANESE TECHNICAL COOPERATION FOR THE EARTHQUAKE DISASTER PREVENTION PROJECT IN THE UNITED STATES OF MEXICO.

The Japanese Implementation Survey Team (the Team), headed by Mr. Fumio Endo, and the authorities concerned of the Government of the United States of Mexico, headed by Lic. Salvador Pomar Fernández, Director General of the National Disaster Prevention Center, had a series of discussions and jointly agreed upon and prepared a Record of Discussions (hereinafter refered to as "R/D") to establish the basis for technical cooperation of the Earthquake Disaster Prevention Project.

The contents of Meeting attached herewith are made to clarify and specify some matters concerning the provisions in the R/D.

Mexico, D.F., March 1, 1990.

遠田 遠郎

Mr. Fumio Endo
Leader, Implementation Survey Team,
Japan International Cooperation Agency, Japan.

~~Lic.~~ Salvador Pomar Fernández
General Director, National Disaster Prevention Center,
The United States of Mexico.

CONTENTS OF MEETING

1. The Mexican side proposed to hold a seminar to commemorate the opening of the National Disaster Prevention Center (CENAPRED) in March or April, 1990. The Japanese side expressed its sincere interest for carrying out the event, and moreover explained that there was an International Research and Development Program for low-cost earthquake-resistant housings and buildings, wich the Japanese Government would start in Fiscal year 1990, and also stated that CENAPRED was expected to participate in it as one of the leading organizations in the Program.

The Mexican side expressed its strong interest in this Program and its desire to carry out an international seminar next fall.

2. In relation to the artificial microtremor experiment treated in discussions between the Japanese team and CENAPRED in November, 1989, the Japanese side asked if there was still interest in carrying it out. To this question the Mexican side proposed that such experiment would be implemented within the framework of the technical cooperation, once it would be properly approved by the Joint Committee, and authorized by the Mexican authorities concerned. The Mexican side proposed that the provision of resources, machinery delete an equipment necessary for this specific project would be supplied by the Japanese side.

The Japanese side understood the situation and agreed to convey the Mexican request to the Japanese authorities concerned.

3. Based upon the Article III.3 of the Attachment, the Mexican side expressed to make the best effort to cover the expenses of maintenance, operation and replacement of the machinery and equipment in the limit of its financial availability. But considering the possibility of some accidents wich may cause high expense to recover, the Mexican side requested the Japanese side the possible technical and financial measures for taking charge of those expenses.

The Japanese side promised to convey the Mexican request to the authorities concerned in Japan.

4. In relation to the program for the dispatch of Japanese experts, the Mexican side requested the Japanese side to

dispatch experts as soon as possible for the smooth implementation of the seismic tests.

The Japanese side promised to make an effort to respond the request.

5. The Japanese side requested the Mexican side to offer the list of supporting staff, office space, furniture and office basic equipment mentioned in Annex III 4 (4) and IV 2 of R/D.

The Mexican side promised to provide the Japanese side with followings:

1) Supporting staff; three (3) secretariats and one (1) driver.

2) Office space; one (1) office room for the Chief Advisor; one (1) office room for the Coordinator; as shown in Fig. 1 attached.

One (1) office room (3.5 m. x 6.5 m.) for each longterm expert and;

Office rooms for short-term experts;

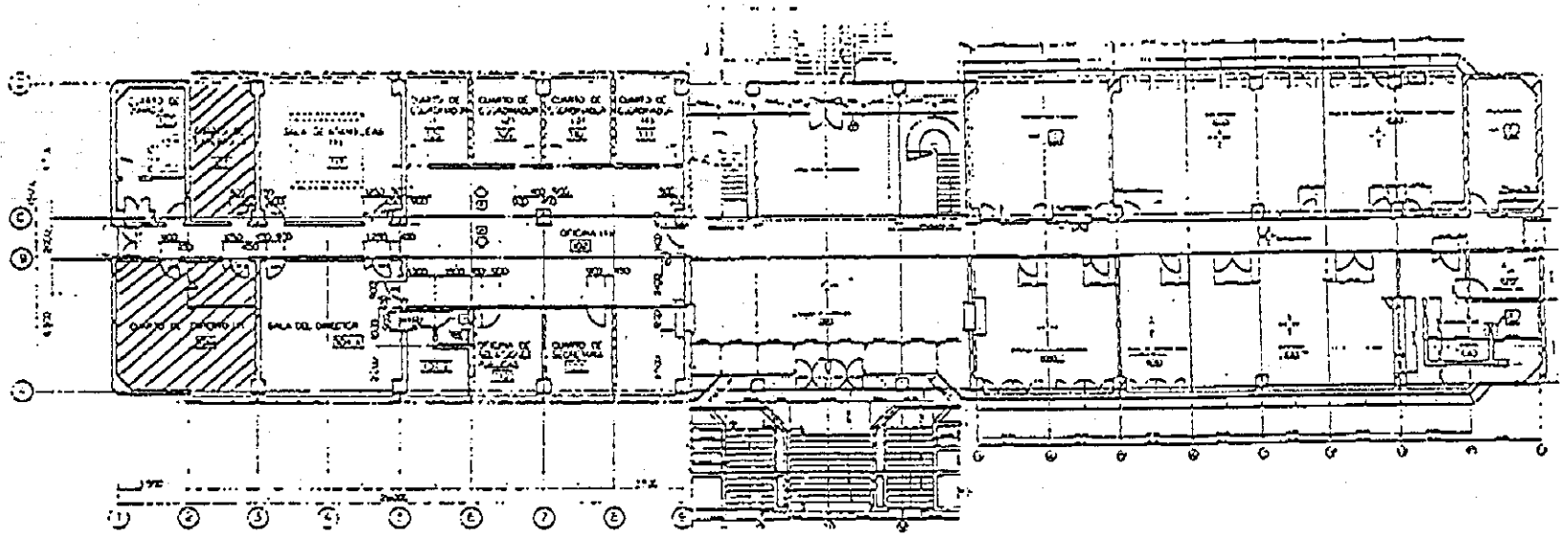
Note: Those rooms offered to the Japanese side can be used by the Mexican side, if previously agreed by both sides.

3) Furniture and office basic equipment; one (1) set of desk and chair, one (1) chair for visitor, one (1) typewriter, one (1) filling cabinet, one (1) bookshelf, one (1) telephone for each expert and also a meetingtable with eight (8) chairs and a set of sofa and armchairs in the Chief Advisor's office room.

The Japanese side requested the Mexican side to provide one (1) car for the Japanese experts.

The Mexican side expressed that it would be very difficult to provide vehicles, but they promised to make an effort to respond the Japanese side's request.

Fig.1



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YAMASHITA ARCHITECTS & ENGINEERS, INC.

EL PROYECTO DE ESTABLECIMIENTO DE UN CENTRO DE PREVENCION DE DESASTRES SISMICOS EN LOS ESTADOS UNIDOS MEXICANOS

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