

# **HRC's Annual Report on Foreign Affairs in 2010 and Work Plan for 2011**

**Hangzhou Regional Center (Asia-Pacific) for Small  
Hydropower (HRC)**

**National Research Institute for Rural Electrification  
(NRIRE)**

**January, 2011**

In 2010, under the leadership of the Ministry of Water Resources (MWR) and Nanjing Hydraulic Research Institute (NHRI) and with the industrious and unyielding efforts of its entire staff, taking Scientific Outlook on Development as the guideline, HRC has made considerable achievements in terms of foreign-aid training, technical exchange and economic cooperation. Entrusted by the Ministry of Commerce, HRC undertook two foreign-aid training workshops on small hydropower; 48 participants from 20 countries attended the workshops. Various SHP cooperation and exchange activities were carried out; a number of hydropower projects were conducted successfully and international SHP market further expanded.

## **I. Foreign-aid training workshops on SHP**

### **1. Training Workshop on Small Hydropower Technology for Developing Countries**



Entrusted by the Ministry of Commerce of China, HRC organized the Training Workshop on Small Hydropower Technology for Developing Countries from 28<sup>th</sup> April to 8<sup>th</sup> June, 2010. 18 engineers and technicians of SHP and energy domain from 10 countries participated in this workshop. Besides lectures, visits and investigation tours which add to 11 days in total had been organized. The places that the visits and tours covered were Laoshikan SHP Station and Xiaofeng Station in Anji, Fuchunjiang Hydropower Station in Zhejiang Province, Tinghu SHP Station and Nanshan SHP Station in Shengzhou City, Ningbo Pumped Storage Station, Zhejiang Fuchunjiang Hydropower Equipment Co., Ltd , Linhai Electrical Machinery Plant, Linhai Machinery Plant, CHINT Group Corporation which was a well-known private enterprise, and Yiwu International Small Commodity Market which was the biggest of its kind in the world. And, the participants were also organized to attend Shanghai World Expo in Shanghai. The working language of this workshop was English.

**The highlights of this training workshop:**

**(1) Attending the Shanghai World Expo**

On 3<sup>rd</sup> June, the participants embarked on a three-day journey to the Shanghai World Expo. When it came that they had to leave Shanghai, they were all somewhat reluctant. The tour to Shanghai World Expo has not only entertained the participants who have a busy schedule for study,

but also served as an excellent opportunity to comprehend the huge development of China since reform and opening up and sense the unique charisma of Shanghai which is the typical representative of modern Chinese cities, thus having greatly publicized China in the new arena.

## **(2) Find a new corporation for visit and investigation**

Apart from small hydropower equipment manufacturers, we also arranged the participants to visit Zhejiang Fuchunjiang Hydropower Equipment Co., Ltd. (hereinafter referred to as “Zhejiang Fuchunjiang”). The international participants couldn’t help complimenting the China’s manufacturing techniques of large and medium hydropower equipment. When the engineer of Zhejiang Fuchunjiang introduced, while pointing to a turbine unit under assembly, that this unit was produced for a station in Vietnam, the Vietnamese participant claimed, “It’s really great pleasure for me to see with my own eyes the manufacturing process of the equipment. I will definitely try my best to say a good word for Chinese manufacturers. ” Other participants posed questions on the company’s cooperating projects with their respective countries and expressed their strong willingness for future cooperation.

## **(3) Hold business discussions**

On the afternoon of 31<sup>rd</sup> May, according to their different nationalities, participants were divided into five groups for a business talk with HRC on international small hydropower cooperation. The discussion

was presided over by Chief of Division of Foreign Affairs and Training Mr. Pan Daqing and Deputy Division Chief Mr. Lin Ning and attended by a dozen experienced engineers of New-Tech R&D Center for M&S Hydro/Hangzhou Yatai Hydro Equipment Completing Co. Ltd (hereinafter referred to as “Hangzhou Yatai”). The participants introduced SHP development in their respective countries, informed the others of the biggest hindrance and difficulty encountered and expressed their strong willingness to cooperate with HRC. HRC engineers listened attentively and made notes, raising suggestions from time to time.

The four-hour talk had served as a good platform for the international participant to obtain a better knowledge of the technologies and services HRC is able to render; meanwhile, HRC engineers were better informed about the demand of each country, thus laying a solid foundation for future hydropower equipment export and technical consultancy service export.

Here are some abstracts from the participants’ evaluation:

“The working members here are very friendly, gentle, helpful and cooperative.”

“We are so grateful that every lecturer is trying hard to convey the knowledge to us. I’m deeply impressed by the workshop, so are the other participants, I think. Besides, during our stay in Shanghai, everything was perfectly and considerately arranged.”

“The courses are very practical and useful to me. I have learned essential knowledge and expertise on SHP development, SHP design as well as SHP application in rural electrification in our country.”

## 2. Seminar on Rural Electrification for Developing Countries



Entrusted by the Ministry of Commerce of China, HRC organized the Seminar on Rural Electrification for Developing Countries from 11<sup>th</sup> June to 8<sup>th</sup> July, 2010. 30 officers and experts of electricity, energy and environment domain from 13 different developing countries came to participate in this seminar in Hangzhou. The contents of lectures were rich and informative, covering the general introduction of rural electrification development in China and its incentive policies, management mechanism of power system and load forecasting for power system and its new technology development, the relationship between rural electrification and environment, the development of new energy for

rural electrification, including wind energy, solar energy and micro hydropower, as well as other contents on small hydropower which is closely related to new energy for rural electrification, including the developing modes of small hydropower development, hydrology, Chinese norms for SHP, hydraulic structure, SHP equipments and automation technology, etc. What's more, Chinese water resources, Three Gorges Project, the South-north Water Diversion Project, Clean Development Mechanism (CDM), etc. were introduced as specialized topics.

Besides the normal informative lectures, visits and investigation tours of 9 days in total had been organized. The places that the visits and tours covered were the world famous Three Gorges Power Station, Tinghu SHP Station and Nanshan SHP Station in Shengzhou City, Ningbo Pumped Storage Station, Hangzhou Changhe Generating Equipment Co., Ltd, Zhejiang Windey Generating Engineering Co., Ltd, etc. And, the participants were also organized to attend the world expo in Shanghai. The working language of this seminar was English.

**The highlights of this seminar:**

**(1)Visiting Three Gorges Project**

On 30<sup>th</sup> June, led by Director of HRC Ms.Cheng Xialei, Chief of Division of Foreign Affairs and Training Mr.Pan Daqing and Mr.Lu Jianping, Chief Engineer of Hangzhou Yatai Planning & Design Institute for Medium & Small Hydro Power (hereinafter referred to as “Design

Institute”), the participants embarked on a five-day journey to Three Gorges. This study tour had been deeply impressive for every participant because they had not only beheld the world famous Three Gorges Dam, which typified China’s advanced hydropower technology, but also enjoyed the beautiful sceneries of China. No wonder one participant said passionately: “Chinese people are so smart and hard-working to have created such a great project.” Another participant wrote in his report of this seminar: “What excites me most is the tour to Three Gorges. I had never expected that I could see the greatest project in the world in my life. I feel so fortunate. That is amazing.”

## **(2) Country report— a platform for mutual communication**

On the afternoon of 5<sup>th</sup> July and on 6<sup>th</sup> July, an SHP business talk was held with all participants being divided into 13 groups by their nationalities. This meeting was presided over by three monitors, and proceeded smoothly. The participants from 13 countries introduced the customs and practices of their countries as well as the stage of electrification development with the aid of PPT, video and other multi-media tools so that their country reports were rich and informative in content, colorful and interesting in form. The reporters were all very confident and passionate when giving presentations, while the rest participants listened attentively, frequently nodding their heads and putting forward some questions thus rendering the atmosphere very

heated and harmonious. The leaders of HRC and some lecturers also participated in the meeting and communicated with participants genuinely and the business talk was concluded with great success.

### **(3)Emergency management**

Before the seminar, HRC held a meeting in preparation for the security of the international training workshop and copies of emergency scheme for the international training workshop were distributed so as to make sure that the emergent cases could be detected and dealt with as soon as possible. On the morning of 13<sup>th</sup> June, Aiko, Tanzanian participant of 2010 Seminar for Rural Electrification, reported that he had a fever and was at once accompanied by an HRC worker to see a doctor in Zhejiang Tongde hospital. His blood sample, which was tested by Hangzhou Center for Disease Control and Prevention, showed that Aiko was infected by acute malaria. Consequently, he was transferred to Hangzhou No.6 People's Hospital for treatment. Although informed by experts on infection that there had been no malaria-transmitting mosquito in Hangzhou City, we took immediate actions of disinfection and mosquito eradication in participants' study and living areas. From the moment that Aiko was discovered infected by malaria to his final settlement in hospital, the leaders of HRC had paid intense attention to Aiko's treatment and recovery. Mr. Pan Daqing, Chief of Division of Foreign Affairs and Training, and Mr. Wang Linjun, Chief of

Administrative Office, had accompanied Aiko to do all the body check and tests painstakingly. Leaders of HRC acquired Mr. Pan Daqing of Aiko's health condition everyday and urged related staff to do work as carefully as possible. With meticulous care, Aiko recovered after three days and resumed his study in HRC.

#### **(4) Business talk held for mutual cooperation**

On the afternoon of 8<sup>th</sup> July, a business talk on international cooperation was held in HRC. Participants made meticulous preparations for this business talk and exchanged ideas with HRC technicians on detailed projects for cooperation. They introduced the conditions of rural electrification in their countries, the demand, obstacles and difficulties for developing rural electrification, and then further discussed with HRC technicians on the orientations of possible future cooperation.

Participants declared their willingness to be the spreaders of technology, culture and friendship among countries after they returned to their motherland with the abundant knowledge and technology on rural electrification that were acquired in China. They would describe to their family members, friends and colleagues a true China and actively promote technological and business exchange and cooperation on rural electrification between China and other developing countries with the purpose of achieving win-win situation.

Here are some abstracts from the participants' evaluation of the seminar.

“The organizing group of the seminar is terrific. The seminar is rich in content and excellent in form which combines lecture with on-site visit.”

“HRC leaders and other staff members are very friendly. Director Cheng, Mr. Pan, and other members of Division of Foreign Affairs and Training are also very helpful.”

“More such training workshops ought to be held for other developing countries, because through this seminar, we are able to discover problems concerning rural electrification construction in our countries. It would be excellent if the training period is 45 days instead of 28 days. ”

## **II. Important conferences held or participated by HRC**

### **1. Promotion Conference for Clean Energy Development in Macedonia was held successfully**



On 4<sup>th</sup> March, under the co-sponsorships of the Chinese Embassy in Macedonia and the Ministry of Economy of Macedonia, proposed and arranged by the Economic and Commercial Counsellor's Office of the Chinese Embassy in Macedonia, HRC held the Promotion Conference for Clean Energy Development in Macedonia with Sinosteel Tiancheng Environmental Protection Science and Technology Co. Ltd. (hereinafter referred to as “Sinosteel Tiancheng”) as co-organizer.

Mr. Dong Chunfeng, the Chinese Ambassador in Macedonia and Mr. Fatmir Besimi, the Minister of Economy of Macedonia were present at the opening ceremony and delivered speeches respectively; Ms. Cheng Xialei, Director of HRC was seated together on the rostrum. Up to 100 business delegates from Macedonia attended this conference. About ten

press agencies came for interview, and local TV channel reported this activity that day. News had also been released on the websites of the Ministry of Foreign Affairs and the Ministry of Commerce of China.

At the conference, Director Cheng Xialei, Mr. Lin Ning and Mr. Xu Wei, the Deputy General Managers of Hangzhou Yatai., presented "SHP Development and Rural Electrification in China", "Development and Application of Chinese SHP Equipment", and "Technology of Renewable Energy and Micro Hydropower". The introduction of solar energy technology was made by Mr. Liu Xuefeng, General Manager of East China Branch of Sinosteel Tiancheng. Four Macedonian experts introduced the current situation and demand on the local development of small hydropower and solar power. After the presentations, participants were divided into two groups, i.e. "Hydropower" and "Solar Power" for diversified and in-depth technical exchanges and discussions on potential projects. Three Macedonian hydropower engineers who had attended HRC's international training workshops before also helped to organize the conference.

The conference was proven to be a full success as the Ambassador Dong addressed in his speech, "Hangzhou Regional Center (Asia-Pacific) for Small Hydro Power, has rich experience in international cooperation for small hydropower and solar power, as well as equipment supply. The conference aims to present an overview to Macedonia, about China's

capability on technical advancement and equipment manufacturing in small hydropower and solar power. We would like to explore cooperation opportunities for private investors and governmental departments between both two countries, and to make contribution to the development of clean energy industry in Macedonia."

## **2. Director of HRC attended the UNIDO Workshop**

On 25<sup>th</sup> May, 2010 Shanghai Expo's "United Nations Industrial Development Organization (UNIDO) Week—Workshop on Small Hydropower for Promoting Green Economy and Sustainable Development of Communities" was held in the UN pavilion of the Expo Park. Vice Minister of Water Resources Ministry, Mr. Hu Siyi, Deputy Director General Mr. Yoshiteru Uramoto were present and delivered speeches.

Mr. Tian Zhongxing, Director of Hydropower & Rural Electrification Bureau of Water Resources Ministry attended this workshop and gave a key-note speech on small hydropower's effect in controlling the global climate change and ecological civilization construction and proposed some new approaches on small hydropower development.

Ms. Cheng Xialei, Director of HRC attended the workshop and answered questions put forward by representatives from both home and

abroad on how Chinese small hydropower standards go global so as to support exportation of Chinese SHP equipment.

The representatives of UNIDO headquarters, China office of UNIDO, International Small Hydropower Association and some other international organizations as well as leaders of related bureaus of Water Resources Ministry, representatives of local governments and companies and experts in small hydropower attended this workshop with the purpose of finding a way to develop environment friendly small hydropower. Some experts of Division of International Cooperation, Science and Technology of HRC also took part in the Workshop.

### **3. HRC leaders participated in the Forum on SHP in China & CDM**

Forum on SHP in China & CDM was held on 14<sup>th</sup> July in Shanghai. Director of HRC Ms. Cheng Xialei and senior engineer Mr. Zhao Jianda from Division of International Cooperation and Technology took part in the forum. The Forum aimed at adapting to the latest changes of international rules and to the developing trends of the international market, exchanging the development experience in small hydropower Clean Development Mechanism (CDM), sharing achievements, building consensus in order to promote China's small hydropower jointly under the context of global climate changes, and facilitating the better and faster development of the small hydropower CDM projects.

Director of Hydropower & Rural Electrification Bureau of Ministry of Water Resources Mr. Tian Zhongxing, Chief of Taihu Basin Authority Mr. Ye Jianchun were present in the meeting and gave speeches. Mr. Tian Zhongxing pointed out that the development of CDM project for hydropower had introduced a lot of funds for the construction of small hydropower which promoted the development of small hydropower in China. He stressed that we should strive for initiative in the international carbon trading market and gradually change the low-end position of our CDM for small hydropower in the international carbon market and the carbon value chain.

At the forum, the leaders of relative ministries and experts introduced the latest changes of CDM international rules and the developing trends of the international market, management and developing policies of China's CDM, emissions permission trading, situation and trends of hydropower CDM and so on. Foreign buyers of hydropower CDM, representatives of hydropower CDM owners and the third-party audit institutions introduced the developing situation of CDM projects and related experience. The Forum also carried out related exchanges and discussions.

About 60 participants were present at the forum, including leaders and experts from Hydropower Bureau and Taihu Basin Authority of Ministry of Water Resources, Department of Social Development of

Ministry of Science and Technology, Institute of Global Climate Change of Tsinghua University, CDM Executive Board members, the CDM Centre of Energy Research Institute of National Development and Reform Commission, IN-SHP, Shanghai Environment and Energy Exchange, Shanghai International Consulting Co., Ltd. and guests and experts from small hydropower authorities of related provinces (autonomous regions and municipalities), research institutions and the International Hydropower Association.

#### **4. Director Cheng Xialei attended 15<sup>th</sup> Annual Convention of China SSC (South-South Cooperation) Network**

On 23<sup>rd</sup> Oct, the 15<sup>th</sup> Annual Convention of China SSC (South-South Cooperation) Network which was sponsored by China International Center for Economic & Technical Exchange of MOFCOM, organized by South-South Global Assets and Technology Exchange (SS-GATE) was held in Shanghai. Senior Advisor of United Nations Industrial Development Organization (UNIDO) Ms. Liang Dan and Director of Special Unit for South-South Cooperation of the United Nations Development Programme (UNDP) Mr. Zhou Yiping were present at the meeting and delivered important addresses. Assistant to the Director of China International Center for Economic & Technical Exchange, Mr. Zhao Yongli and President of South-South Global Assets and Technology Exchange (SS-GATE), Mr. Lin Jian gave speeches respectively. Deputy

Division Chief from China International Center for Economic & Technical Exchange, Ms. Zhang Wei presided over the meeting and made an annual working report of China SSC Network of 2010. About 60 representatives from the member agencies of the network attended the meeting.

At the meeting, the member agencies reported the work carried out in 2010 in the field of south-south cooperation and offered suggestions on the improvement of the network. Director of HRC Ms. Cheng Xialei gave a report on the work that HRC has been conducting in 2010, which includes: conducting SHP researches and standardization work, organizing foreign-aid SHP training workshops, successfully hosting Promotion Conference for Clean Energy Development in Macedonia and carrying out SHP technical consultation and international trade and so on, among which Ms. Cheng put emphasis on the internationalization of SHP norms and suggested that this item should be listed in the working program of China SSC Network. The proposal received full recognition from Ms. Liang Dan, the Senior Advisor of United Nations Industrial Development Organization who added that Chinese enterprises must breach technical barriers to enter into international market and expand international trade. Madam Cheng and other participants also took part in the celebration of 65<sup>th</sup> anniversary of the UN establishment in the Shanghai Expo on 24<sup>th</sup> Oct.

### **III. International Communication and Cooperation**

In 2010, HRC has dispatched 9 teams of 22 people abroad and received 21 batches of 69 foreign guests including Director General of Atmospheric Science and Technology Directorate, Environment Canada Charles Lin and his delegation, Norwegian Minister of Oil and Energy, Mr. Terje Riis-Johansen, and the Governor of Nordland, Mr. Odd Eriksen and their delegation, etc. These visits have greatly facilitated HRC's international exchanges, enhanced its international influence and promoted HRC's cooperation with international SHP counterparts, thus bringing win-win result.

#### **1. Mr. Murat, design engineer of Pik enerji—the design company of Murat II, visited HRC**

On 26<sup>th</sup> February, Mr. Murat, engineer of Pik enerji which was the design company of Murat II in Turkey, visited Hangzhou Yatai. He discussed with engineers of HRC on the civil works, the drawings and the design of Murat Power Station.

In the meeting, Deputy General Manager of Hangzhou Yatai Mr. Xu Wei and engineer of Hangzhou Yatai Mr. Wang Xuefeng rectified the problems existing in the design, which saved a lot of materials, and Zhang Tian, the liaison of this project, also discussed with Mr. Murat on the subcontract-related things, including the progress of this project, the

design and electrification. The meeting proceeded smoothly with many important problems being solved successfully.

## **2. Director General of Atmospheric Science and Technology**

### **Directorate, Environment Canada paid a visit to HRC**

On the morning of 28<sup>th</sup> April, 2010, Mr. Charles Lin, Director General of Atmospheric Science and Technology Directorate, Environment Canada paid a visit to HRC, accompanied by the other two respected guests. The leaders and experts of HRC had a friendly and pleasant meeting with the Canadian delegation.

Director General Charles Lin made a presentation on the efforts and achievements of Environment Canada in the fields of weather, climate and air control. Meanwhile, he expected to learn more about SHP development in China.

Following a warm welcome to the guests on behalf of HRC, Director Cheng Xialei detailed the status quo of SHP development in China, as well as the efforts and achievements of HRC in the field of small hydropower. It was also mentioned that HRC hopes to introduce the technology of VLH turbo-generator unit from Canada with kind assistance from Environment Canada.

Director General Charles Lin applauded the successful development of SHP in China, especially the good experience of "Substituting SHP for Fuel" which deserves to be popularized. After returning to Canada, he

would help HRC to promote the introduction of VLH technology. Moreover, the potential cooperation on renewable energy was discussed at the meeting.

### **3. President of Gena Electric France visited HRC**

From 2<sup>nd</sup> to 4<sup>th</sup> May, Mr. Philippe Quinzin, President of Gena Electric France and Mr. Jean Michel Natrella, General Manager of Gena Electric France, visited HRC. Accompanied by General Manager of Hangzhou Yatai Mr. Dong Dafu, Deputy General Manager Mr. Lin Ning, and Mr. Meng Ke, the interpreter, they visited HRC's laboratory and the subcontractors --- the hydropower factories in Zhejiang Province. They also discussed with our managers on the equipment supply for equipment updating of several small hydropower stations in Guinea and the preliminary cooperation intention have been reached.

### **4. Thailand's TEAM Group visited HRC**

From 7<sup>th</sup> to 13<sup>th</sup> May, representatives of Thailand's TEAM Group, Mr. Thongchai Mantapaneewat, Mr. Chawalit Chantararat, Dr. Jirapong Pipatt anapiwong and Mr. Thanawara Thongluan, visited Hangzhou Yatai. Representatives from both sides discussed the new energy exploitation project in detail and visited some manufacturers.

Ms. Cheng Xialei, on behalf of HRC, extended warm welcome to the guests from TEAM Group and gave a detailed introduction to the experience of China's small hydropower development, HRC's

contribution and achievements in small hydropower development and expressed our sincere wishes to cooperate with TEAM Group in jointly expanding Thailand's small hydropower market in the future.

## **5. Norwegian Minister of Oil and Energy and Governor of Nordland and their delegation visited HRC**



On 29<sup>th</sup> May, headed respectively by the Norwegian Minister of Oil and Energy, Mr. Terje Riis-Johansen, and the Governor of Nordland, Mr. Odd Eriksen, the two distinguished delegations from Norway jointly paid a visit to HRC. The 16 Norwegian guests who were accompanied by Deputy Director Gu Jianxin and Vice Division Chief Wang Jun from the Department of Foreign Affairs of Zhejiang Province received a warm welcome. Director of HRC, Ms. Cheng Xialei met the delegations, and together with Deputy Director Huang Jianping and the Chiefs from the

Division of Foreign Affairs and Training, Division of International Cooperation, Science and Technology, and the Center of R& D, held a cordial and friendly talk with the guests.

After making an informative presentation on SHP Development in China and HRC Briefing, Ms. Cheng Xialei, together with the other HRC participants, offered the satisfactory answers to all the questions from the Norwegian guests concerning the issues on SHP planning, regional differences in SHP development, integration of SHP into power grid, SHP cost and CDM, etc.

Both Mr. Terje Riis-Johansen and Mr. Odd Eriksen delivered warm speeches, showing their high appreciation to HRC for the kind hospitality and the rich-content introduction. They mentioned that the cooperation on water resources management would be carried out between the related sector of Norway and the Ministry of Water Resources of China, and they hoped that further steps would be taken into the field of SHP.

## **6. Representatives from Pakistan United Electric Company visited**

### **HRC**

From 31<sup>st</sup> May to 6<sup>th</sup> June, Mr. Sardar Sajid Javed and Mr. Zahid Aziz Mughal from Pakistan United Electric Company visited Hangzhou Yatai. The two sides held a discussion on bilateral cooperation over the equipment of Hillan (2×300KW), Rangar-I (2×300KW) and Halmat (2×160KW) projects. Accompanied by engineers of Hangzhou Yatai and

interpreter, Mr. Sardar Sajid Javed and Mr. Zahid Aziz Mugha visited equipment manufacturers. A contract was signed and both parties expressed their willingness for more intense future cooperation. Deputy General Managers of Hangzhou Yatai Mr. Lin Ning and Mr. Xu Wei, and Project Manager Mr. Wang Xiaogang, accompanied Mr. Sardar Sajid Javed and Mr. Zahid Aziz Mugha throughout the whole process.

## **7. Mr. TASKIN, the owner of Garzan Project of Hangzhou Yatai visited HRC**

From 10<sup>th</sup> to 13<sup>th</sup> June, Mr. TASKIN, the owner of Garzan Project of Hangzhou Yatai visited HRC. HRC workers accompanied representatives of Sinosteel Tiancheng, the major contractor of this project and Mr. TASKIN, the owner of Garzan Project to visit Zhuoyu Valves Company in Changsha , Kinte Industrial Co. Ltd., Nanping Electrical Machinery factory and Hangzhou Yatai to inspect the manufacturing of valves, excitation system, turbine-generator and monitoring system and a discussion was held to solve the existing problems.

By comparing the advantages and disadvantages of all the manufacturers, Mr. TASKIN showed his preference to those of large scale. Mr. Xu Wei, Deputy General Manager of Hangzhou Yatai introduced the features and background of Chinese manufacturers in the process of visiting and Mr. TASKIN finally chose a factory to his satisfactory.

## **8. The owner of Murat I & II Hydropower Projects in Turkey visited HRC**

On 26<sup>th</sup> June, Mr. Mehmet Gunes, the owner of Murat I & II Hydropower Projects in Turkey together with two assistants visited HRC. Leaders of Hangzhou Yatai, Mr. Dong Dafu, and Mr. Lin Ning introduced the background and current business of HRC and Hangzhou Yatai; the project team briefly reported the execution progress of this project. Acknowledging the capability of Hangzhou Yatai in hydropower equipment completing, Mr. Mehmet Gunes expressed his belief that this project could be finished successfully and expressed his hope that the standard of Chinese equipments could be further improved and Chinese equipment manufacturers were able to manufacture equipments with high quality following the standards. Mr. Mehmet Gunes also visited HRC's laboratory and was satisfied with the quality of Garzan Project's SCADA system, which was still in debugging.

## **9. Board Chairman of Dragon Inportacao e Exportacao de Produtos Manufaturados Ltda visited HRC**

On 27<sup>th</sup> July, a five-person delegation led by Mr. Qiu Chengyan, Board Chairman of Dragon Inportacao e Exportacao de Produtos Manufaturados Ltda. visited Hangzhou Yatai. Deputy General Manager of the Hangzhou Yatai Mr. Xu Wei and Project Managers Mr. Wang Xiaogang and Ms. Zhang Liping attended the meeting. Mr. Xu introduced

the background and achievements of HRC as well as the information of Hangzhou Yatai and its business home and abroad. Representatives of both sides discussed the exploitation of small hydropower project in detail and expressed vision for more cooperation in the future projects.

#### **10. The owner of Turkey SAF-I Project visited HRC**

From 23<sup>rd</sup> to 24<sup>th</sup> August, a delegation of three people led by Mr. Mustafa, the owner of SAF-I Project in Turkey visited HRC and made a bilateral cooperation discussion on the equipment of hydropower project with representatives of Hangzhou Yatai. Accompanied by Hangzhou Yatai's interpreter, Mr. Mustafa and his delegation visited Hangzhou Lulutong Generating Equipment Company and Andi Reservoir in Jinhua. The two parties discussed in detail the small hydropower project development and expressed willingness to cooperate over more future projects.

#### **11. General Manager of ICTAC Company in Turkey visited HRC**

On 27<sup>th</sup> August, a three-person delegation led by General Manager of ICTAC Company which was a business partner of Hangzhou Yatai, visited HRC. The two parties discussed the horizontal unit project and visited equipment manufacturers in the company of Deputy General Manager of Hangzhou Yatai Mr. Lin Ning and the interpreter. As a group company with large business scale, ICTAC bears quite strong ability in contracting. During the meeting, ICTAC SUPHIA showed great interest

in Hangzhou Yatai and signed a cooperation plan for three projects in the later phase.

## **12. CEO of Papua New Guinea Hydropower Development Company and Mr. Allan Guo visited HRC**

On 17<sup>th</sup> September, Mr. Warren Woo, CEO of Papua New Guinea Hydropower Development Company and Mr. Allan Guo visited HRC. Deputy Director of NRIRE, Mr. Huang Jianping informed foreign guests of HRC's basic information, the work that are conducted and the achievements that are made by HRC in SHP domain as well as China's experience in SHP development. Chiefs of relevant divisions discussed with foreign guests on the joint development of Papua New Guinea's SHP resources.

Papua New Guinea boasts rich SHP resources while the electrification rate of the country is only 20%. The guests claimed that they were deeply impressed by the expert team of HRC with comprehensive SHP expertise, complete facilities and equipment, rich national and international SHP developing experiences. They hoped earnestly to develop rich SHP resources in Papua New Guinea jointly with HRC.

## **13. Indian guests Mr. Soni and his delegation visited HRC**

On 20<sup>th</sup> September, Mr. Valmik Soni and his delegation from India paid a visit to HRC. Hangzhou Yatai Hydro Equipment Completing Co., Ltd and the Division of Foreign Affairs and Training of HRC jointly received the Indian guests and the two parties held a friendly and cordial meeting.

India is very rich in rural hydropower resources, which so far have not yet been well exploited. As successful developers in the fields of real estate and resorts, the guests expressed their keen desire to develop the local hydropower, and they hoped to get technical assistance from HRC and import SHP equipment from China.

During the meeting, the guests introduced the concrete conditions of the potential MHP projects, based on which HRC provided preliminary consultation and answered questions as well. The feasibility of the projects and implementation plan were discussed together. The Indian guests sincerely gave a high evaluation on HRC and the bilateral cooperation in future was expected to be fruitful.

#### **14. Chief representatives of Indonesia BAGUS KARYA Company in China and his delegation visited HRC**

On 25<sup>th</sup> September, Mr. Lin Konggui, Chief Representative of Indonesia BAGUS KARYA Company in China and his companions visited HRC. Director of HRC, Ms. Cheng Xialei, and Deputy Director of

NRIRE, Mr. Huang Jianping and some Division Chiefs held a cordial and friendly meeting with the foreign guests. Director Cheng Xialei introduced HRC's briefing and expressed the willingness to cooperate with BAGUS KARYA Company. Mr. Lin introduced the details of Indonesian small hydropower resources and the incentive SHP policies issued by the Indonesian Government, as well as the plan of BAGUS KARYA Company on developing small hydropower. Both sides together made a specific arrangement for the collaborative project to be conducted on next step and discussed the tentative plan and framework for long-term cooperation.

#### **15. Mr. Kishor from Nepal Solid Waste Resources Management Center visited HRC**

From 21<sup>st</sup> to 22<sup>nd</sup> October, Mr. Kishor from Nepal Solid Waste Resources Management Center visited HRC. Mr. Kishor and his delegation also visited the thermal powerhouse under Hangzhou Jingjiang Group in the company of Deputy General Manager of Hangzhou Yatai, Mr. Lin Ning and the interpreter. The two sides had an in-depth exchange on related issues in the prophase of waste incineration powerhouse, and expressed their wishes to conduct concrete cooperation on the future projects.

#### **16. Participants of Asia Pacific Leadership Program Visited HRC**

On the afternoon of 19<sup>th</sup> October, participants of Asia Pacific Leadership Program Mr. Rahul Shah from Nepal and Mr. Eric Escosio Noble from the Philippines visited HRC. Director of HRC Ms. Cheng Xialei and Chiefs of the Division of Foreign Affairs & Training, Division of International Cooperation, Science & Technology and Hangzhou Yatai met with the guests and had a cordial exchange with them.

Director Ms. Cheng Xialei firstly introduced the basic situation of the development of Chinese small hydropower and the overall policy in the field of small hydropower development. Mr. Lin Ning, Deputy General Manager of Hangzhou Yatai, introduced HRC's Briefing and HRC's work in small hydropower. Director Cheng Xialei and Division Chiefs jointly answered questions raised by the foreign guests in terms of the exploitation and development of the renewable energy, the innovation in energy fields and cultivation of leaders, etc.

The foreign guests were grateful for HRC's warm reception. Mr. Shah expressed their keen desire to cooperate with HRC in energy and other fields, at the same time he earnestly recommended HRC's participation in Asia Pacific Leadership Program.

### **17. Norwegian delegation visited HRC**

On 22<sup>nd</sup> October, the Norwegian delegation, headed by Mr. Helge Stanghelle, Director of Rana Development Company (Rana Utviklingsselskap) together with Ms. Karen Kuvaas, mayor of Narvik and

other eight members visited HRC. Director of HRC, Ms. Cheng Xialei together with heads of Division of Foreign Affairs and Training, Division of International Cooperation, Science & Training and the New-Tech R&D Center for M & S Hydro received the delegation and held a cordial and friendly meeting with them.

Director Cheng Xialei firstly delivered a speech of welcome to the Norwegian guests for visiting HRC. Chief of Foreign Affairs and Training Division, Mr. Pan Daqing gave a briefing on small hydropower development in Zhejiang Province and Deputy General Manager of Hangzhou Yatai Mr. Lin Ning presented HRC's briefing and its work in the field of small hydropower. Ms. Cheng Xialei together with Division Chiefs replied questions from the Norwegian guests concerning SHP planning, integration of SHP into power grid, SHP cost and CDM, etc. Mr. Helge Stanghelle, head of the delegation, briefed HRC leaders on the basic situation of energy market in Norway and discussed energy and power issues jointly.

#### **18. Mr. Taskin from Turkish Fernas Company visited HRC**

On 10<sup>th</sup> December, Mr. Taskin from Turkish Fernas Company visited HRC, for the sake of the Garzan Project in Turkey. Leaders of Hangzhou Yaitai and Garzan Project team members attended the meeting in the morning.

Project Manager of Engineering introduced the SCADA system of Garzan Project to Mr. Taskin, focusing on the designing of SCADA system for Garzan Project. Amendment and supplement were made for the single line drawings of the project and approved by both parties.

The rapid development of HRC surprised the Turkish guests. And their confidence in cooperating and purchasing our equipment and technology was enhanced. Mr. Taskin sincerely hoped that broader cooperation would be made between us in the near future not only on the purchase of hydropower equipment, but also in the designing field of hydropower.

#### **19. Peruvian agent and his wife visited HRC**

On 11<sup>th</sup> December, the Peruvian agent of Hangzhou Yatai Mr. Luis and his wife paid a return visit to HRC for the hydropower project in Peru. Director of HRC Ms. Cheng Xialei, heads of Hangzhou Yatai Mr. Dong Dafu and Mr. Lin Ning, and Peruvian project team members attended the meeting in the morning.

The rapid development of HRC won our guests' admiration. Mr. Luis sincerely hoped that broader cooperation would be made between both sides in the near future not only on the purchase of hydropower equipment, but also on hydropower technology, such as hydropower design, etc.

#### **20. Mr. Sajid from Pakistani UEC Company visited HRC**

On 20<sup>th</sup> December, Pakistani guest Mr. Sajid from Union Electric Corporation paid a visit to HRC for inspecting the finished electro-mechanical equipment of three small hydropower projects in Pakistan. Mr. Dong Dafu and Mr. Lin Ning, heads of Hangzhou Yatai, together with project team members attended the meeting. The project manager reported the progress of equipments manufacturing. The two sides discussed the development of new project.

Impressed by HRC's professional team, first-class service and profound engineering background, Mr. Sajid was very satisfied with the quality of equipment and surely believed that the equipment provided by HRC would serve its function successfully.

The visit further promoted the mutual friendship and broadened the cooperation in the near future.

## **21. Turkish Guest Mr. Hakki from DURAKBABA Company visited HRC**

On 24<sup>th</sup> December, Turkish guest Mr. Hakki from DURAKBABA Company visited HRC. Mr. Dong Dafu, General Manager of Hangzhou Yatai together with Deputy Managers Mr. Lin Ning and Mr. Xu Wei attended the meeting on the afternoon of 25th. At the meeting, Mr. Lin Ning introduced HRC's Briefing and complete equipment export projects in recent years which left Mr. Hakki a deep impression. Later on, two parties discussed the projects that could reach in-depth cooperation, such

as hydropower, wind power, solar energy, etc. Both parties felt confident about the projects that would be carried out in the future. Then, accompanied by the HRC staff, Mr. Hakki paid a visit to factories and greatly appreciated these factories, which laid a solid foundation for broad future cooperation.

#### **IV. Research and Information Exchange**

1. On 22<sup>nd</sup> April, sponsored by the Hydropower Committee of Chinese Hydraulic Engineering Society, the Small Hydropower Committee of Chinese Hydroelectric Engineering Society and the International Network on Small Hydropower, the National Research Institute of Rural Electrification (HRC) and the International Centre on Small Hydro Power co-organized the first "China Forum on Small Hydro Power" in Hangzhou with "Small Hydropower and Ecological Civilization" as the theme. Mr. Hu Siyi, Vice Minister of Water Resources, attended the forum and delivered a speech; Mr. Tian Zhongxing, Director of Rural Hydropower and Electrification Development Bureau under the Ministry of Water Resources, chaired the forum.

Mr. Tian Zhongxing, Director of Rural Hydropower and Electrification Development Bureau under the Ministry of Water Resources, gave a keynote speech entitled "New Mission of Small Hydropower". The forum collected eighty-five theses in total, forty-one

of which were selected into conference proceedings, among which three are awarded first prizes, five second prizes and seven third prizes. The conference proceedings were included in the magazine Small Hydropower, No. 2, 2010.

Meanwhile, the second "China Forum on Small Hydro Power" is planned to be held at the end of 2011 and the collection for theses is already initiated. The theme of this forum is designated "Small Hydropower and Livelihood Improvement". The range of theses include:

1. Development plan of rural hydropower in the new age;
2. Innovative research on mechanism to benefit farmers during rural hydropower development;
3. Development and application of management information system for rural hydropower;
4. Researches on efficiency increase and emission reduction vs ecologically friendly technology for rural hydropower;
5. Technical researches on security guarantee of rural hydropower;
6. R&D and promotion of new technology and new equipment in rural hydropower;
7. Standardization system researches on small hydropower;
8. Construction and management of new rural electrification;
9. Construction and management of substituting SHP for fuel;
10. Security supervision of rural hydropower;
11. Other related researches.

2. In terms of scientific research, in 2010, seven scientific research projects were completed and passed the acceptance; nine projects are

being implemented as scheduled; contracts of six projects were newly signed; nine projects are under application, three of which are publicly announced. In 2010, 28 standards were formulated and amended, among which two were issued and implemented, six were reported for approval, three passed the acceptance, three were reported for investigation and six exposure drafts were submitted.

3. In 2010, HRC organized and implemented six domestic training workshops: two training workshops on related standards of substituting SHP for fuel, three training workshops on security supervision in rural hydropower, one training workshop on related standards of new rural electrification. 365 participants from 24 provinces (autonomous regions, municipalities) and the Xinjiang Production and Construction Corps attended the training.

4. In 2010, HRC published 22 scientific papers and one monograph. "Digital Power Leakage Protection Technology" was bestowed Second Prize of 2010 Dayu Water Resources Scientific and Technology Awards. *Technical Specification about the Type Parameter and Performance of Small Hydraulic Turbine* won the second prize in Zhejiang Province and the first prize in Xihu District; three standards: *Operation Regulations for the Installation of Power Leakage Protector*, *Hydraulic Power Design Discipline for Small Hydropower*, *Specification on Compiling Hydropower Development Plan of Medium and Small Rivers* were

awarded first prize in Hangzhou. Ms. Cheng Xialei, Director of HRC, was bestowed “Award for China Foreign Aid Dedication” by MOFCOM. Mr. Lu Jianping was bestowed Advanced Individual Award by MWR for Technical Supervision in Water Resources.

5. The edition and publication of English small hydropower magazine of 2009-2010 have been finished, achieving the shift from monochrome publication to chromatic one and completed an essential leap not only in terms of the contents and writing materials, but also in terms of layout edition, which received enormous compliments. HRC’s website is updated on time, especially the timely release of information of two small hydropower training workshops and important HRC news. In total, there are 73 news and 36 pieces of English information.

## **V. Equipment completing and export**

In 2010, Hangzhou Yatai Hydro Equipment Completing Co. Ltd has newly signed contracts with foreign clients for providing complete sets of equipment of USD 8.5967 million (RMB57.25 million yuan). It has undertaken the projects of electromechanical equipment completing for the three small power stations in Pakistan: Hillan (2×320KW), Rangar-I (2×320KW), Halmat (2×160KW), the equipment shipment was made in late December. Newly signed projects of electromechanical equipment completing for the two power stations in Turkey, KALE (3×11,580kW) and OSMANCIK (2×4830kW) have entered into the phase of

manufacturing. Automatic supervision control system contracts for Turkish GARZAN Cascade I Power Station, Azerbaijan Chichekli Power Station and Armenian GETIK Power Station were newly signed. OTLUCA-I, OTLUCA-II, BOGUNTU, CAMLICA, SARACBENDI and KARTALKAYA projects were under implementation, among which five have now entered into the phase of final installation and debugging. CAMLICA project is expected to be put into operation at the end of the year. Turbine-generator installation of KARTALKAYA project was suspended owing to the replacement of penstock by the owner. Another installation will be conducted in the first half of 2011.

## **VI. Engineering Design**

In 2010, Planning & Design Institute for M/S Hydro has undertaken 20 engineering design projects, the contract value of which amounts to RMB13.62 million yuan. The projects undertaken include: bid design and construction drawing of PHUONG DO Station in Vietnam, PAKKAT Station in Indonesia; pipeline design of Turkish YAZNIZCA Station; design review of LAHIENG2 Project in Phuc Yen, Vietnam; feasibility studies and technical consultation of TOL MINI HYDRO Project in Papua New Guinea; design contract of THUAN HOA Hydropower Engineering Construction in Vietnam (30MW); Indonesian RAHU2 Hydropower Station Project. Projects under design include: engineering design of Thai An Hydropower Station in Ha Giang, Vietnam;

engineering design of Muong Hum Hydropower Station in Lao Cai, Vietnam; preliminary appraisal and bid-inviting design for TRAM TAU Station in Vietnam; construction design for Thai An Hydropower Station in Vietnam. The follow-up projects include: tendering and preliminary negotiations for projects in Vietnam, Kenya, Albania, Papua New Guinea, and the US, etc.; preliminary work of four power stations that People ELE. Appliances Group China plans to undertake the EPC; design and bid of a 75MW power station in Kenya.

## **VII. Working plan in 2011**

2011 is a crucial year for HRC's rapid and scientific development. This is the year when we should unite to strive for progress under the guidance of Deng Xiaoping Theory and the important thoughts of "Three Representatives" and seriously complement the spirit of the CPC's 17th Congress and the 5th Plenary Conference of 17th Central Committee and carry out the Scientific Concept of Development in an all round way. So, we must concentrate on the following work:

1. Earnestly implement foreign policy and working policy of water conservancy formulated by the Central Government, endeavor to carry out multilateral cooperation, actively applying for and hold foreign aid small hydropower training workshops of the Ministry of Commerce and make greater contribution to cultivating more professional technical talents for international small hydropower development, and laying a

solid foundation for promoting the friendship and cooperation between China and other developing countries.

While actively applying for training workshops of Ministry of Commerce, the international and domestic enterprise-oriented training workshops should also be vigorously enhanced. Small hydropower training workshop should be held according to the demands of governmental sectors at home and abroad as well as those of the public institutes and enterprises. On one hand, we shall provide training workshops for national enterprises under the strategy of “Going Global”; on the other hand, we could offer small hydropower technology and experience for foreign governments and enterprises, giving HRC’s advantages to full play thus promoting international exchange and cooperation.

2. Carry out management and technical researches on foreign rural electrification system and mechanism and ecology-friendly small hydropower development, and intensify small hydropower standard internationalization cause. At the same time, cultivate a batch of comprehensive talents that are capable of technology, management and communication through bilateral, multilateral and other channels to create opportunities for HRC’s sustainable development.

3. Implement “Going Global” strategy, take full advantage of the existing international platform, make use of the opportunity brought by

foreign aid trainings, actively expand the market in Africa, South America, Southeast Asia, East Europe, etc., broad the fields, expand the channels and approaches of economic cooperation, undertake energetically small hydropower programs and scientific research projects, continue to carry out foreign engineering consultation, contract and labor service cooperation.

4. Strengthen technological innovation, promote the international cooperation with developed countries, learn advanced technologies and management experience, seize the opportunity and face the challenge in a more active attitude, further promote all-direction, multi-level and wide-range foreign cooperation. In 2011, HRC plans to introduce two important items of technology: (1) Introduce American specific integrated chip for grid energy-saving apparatus. (2) Introduce foreign ultra-low head/ non-head small hydropower technology.

5. In order to celebrate HRC's 30th anniversary, edit and publish *30-Year History of HRC*.

6. Verify and publish the French version of the teaching material *Small Hydropower*.

No.	Time	Organization/Country	Guest(s)	Briefing
1	16 Feb.	Pik Enerji Company, Turkey	1	The discussions were held on some details about the design of MURAT Hydropower Project in Turkey.
2	28 April	Atmospheric Science and Technology Directorate, Environment Canada	3	A presentation on the efforts and achievements of Environment Canada in the fields of weather, climate and air quality control was made by Director General Charles Lin of the Directorate, and the guests were shown the status quo of SHP development in China. The potential cooperation on renewable energy was also discussed at the meeting and the guests would help HRC to introduce the VLH turbine-generating technology from Canada and France.
3	2-4 May	Gena Electric France	2	The discussions were held on equipment supply for the SHP stations in Guinea. Visits to some local hydropower stations and equipment manufacturers were also arranged for the guests—the President and the Project Supervisor of Gena Electric France
4	7-13 May	TEAM Group of Companies, Co., Ltd, Thailand	4	The in-depth discussions were held on the development of new energy projects. Visits to some equipment manufacturers were also arranged for the guests.
5	29 May	Delegations from Norway (Headed respectively by the Norwegian Minister of Oil and Energy, Mr. Terje Riis-Johansen, and the Governor of Nordland, Mr. Odd Eriksen)	16	An informative presentation on SHP Development in China and HRC Briefing was made by HRC Director Ms. Cheng Xialei, and HRC experts offered the satisfactory answers to all the questions from the Norwegian guests concerning the issues on SHP planning, regional differences in SHP development, integration of SHP into power grid, SHP cost and CDM, etc. Both Mr. Terje Riis-Johansen and Mr. Odd

				Eriksen mentioned that the cooperation on water resources management would be carried out between the related sector of Norway and the Ministry of Water Resources of China, and they hoped that further cooperative steps would also be taken into the field of SHP.
6	31 May - 6 June	Union Electric Corporation Pvt. Limited, Pakistan	2	The discussions were held on the details of Hillan (2×300KW), Rangar-I (2×300KW) and Halmat (2×160KW) hydropower projects. The contracts were signed and more cooperation was expected to be carried out in future. The visits to some equipment manufactures were also arranged for the guests.
7	10-13 June	Owner of Garzan Hydropower Project, Turkey	1	The views were exchanged on the issues of equipment based on the visits to the related manufacturers for checking the production of valve, excitation system, turbine-generating unit and control & supervision system, etc.
8	26 June	Owner of Murat I & II Hydropower Projects	2	The backgrounds and achievements of HRC and its subsidiary Hangzhou Yatai Company as well as the implementation of Murat Project were introduced. The owner got to know more about the company and believed that the project would be fulfilled smoothly and the standards for equipment production were expected to be improved. The guests also visited the laboratory and were satisfied with the SDADA system of Garzan Project under debugging.
9	27 July	Dragon Agenciamento de Importacao e Exportacao., Brazil (Headed by the Board Chairman)	5	The productive discussions were held and bilateral cooperation was expected to be carried out in future.
10	23-24	Owner of SAF-I	3	The discussions were held on bilateral

	Aug.	Hydropower Project, Turkey		cooperation of hydropower equipment supply. The visits to some local hydropower stations and equipment manufacturers were also arranged for the guests.
11	27 Aug.	ICTAC Company, Turkey (Headed by the General Manager)	3	The discussions were held on bilateral cooperation of the hydropower project with horizontal units. The visits to some equipment manufacturers were also arranged for the guests.
12	17 Sept.	Hydro Development Ltd., Papua New Guinea (Headed by the CEO)	2	HRC Briefing was introduced by Mr. Huang Jianping, Deputy Director of NRIRE. The discussion was held on the bilateral cooperation. The guests sincerely hoped to cooperate with HRC on the development of the abundant SHP resources in Papua New Guinea.
13	20 Sept.	Indian Guests	2	The plan for local SHP development was introduced by the visitors, based on which the feasibility and implementation were discussed, and the initial consultation was offered by HRC. The guests gave a high evaluation on HRC and the bilateral cooperation in future was expected to be fruitful.
14	25 Sept.	BAGUS KARYA Company, Indonesia (Headed by the Chief Representative in China)	3	The HRC briefing and the details of Indonesian SHP resources and the incentive SHP policies as well as the plan of BAGUS KARYA Company on SHP development were introduced respectively by the two sides. A specific arrangement for the collaborative project to be conducted on next step and the tentative plan and framework for long-term cooperation were made together.
15	19 Oct.	Participants of Asia Pacific Leadership Program	2	A cordial exchange was made and the guests expressed their desire to cooperate with HRC in energy and other field.
16	21-22	Solid Waste Resources	1	An in-depth discussion was made on the

	Oct.	Management Center, Nepal		preliminary issues of refuse incineration plant based on the visit to the thermal plant and the concrete cooperation on the projects in future was expected.
17	22 Oct.	Delegation from Norway (Headed by Mr. Helge Stanghelle, Director of Rana Development Company (Rana Utviklingselskap) and Ms. Karen Kuvaas, mayor of Narvik)	10	The SHP development in Zhejiang Province, the HRC's briefing and its work in the field of SHP, as well as the basic situation of energy market in Norway were introduced respectively by the two sides. The issues concerning energy, SHP planning, integration of SHP into power grid, SHP cost, CDM, etc. were discussed together. The concrete cooperation in the field of energy was expected.
18	10 Dec.	Fernas Company, Turkey	1	Some design details about the SCADA system of Garzan Hydropower Project were discussed and confirmed. The guest expressed the desire to carry out more cooperation with HRC in future.
19	11 Dec.	Project Agent, Peru	2	A cordial exchange was made between the two sides. The guests expected to broaden the cooperation with HRC, not only on equipment supply but also on hydropower design.
20	20 Dec.	Union Electric Corporation Pvt. Limited, Pakistan	3	The progress on the cooperative projects was briefed, and the issues for equipment acceptance and the new projects were discussed. The guests were satisfied with the equipment quality and expected the successful operation of the stations.
21	24 Dec.	DURAKBABA Company, Turkey	1	The efforts and achievements of HRC and its subsidiary Hangzhou Yatai Company were introduced, and the in-depth discussions were made on bilateral cooperation in the field of hydropower, wind power and solar energy. The visits to some equipment manufacturers were also arranged for the guest.

## Appendix 2

**HRC's Outbound Missions in 2010**

No.	Time	Delegate(s)	Country	Objectives and Results
1	1-10, 1-24 March	2 2	Macedonia & Turkey	In Macedonia, the Promotion Conference for Clean Energy Development was held successfully, and the discussions with the local developers in the field of hydropower and solar energy were made widely, based on which the fruitful bilateral cooperation were expected to be carried out in future.  In Turkey, visits were paid to the owners of the related cooperative projects for view exchange and technical discussion.
2	11-24 April	1	Nepal	The follow-up seminar of the Advanced Hydropower Management Training of SIDA was attended with the experience of rural electrification and renewable energy gained.
3	12-27 May	4	Turkey	Visits were paid to PIK ENERJI, AKFEN and some other companies, and the technical issues of cooperative projects and the marketing development were discussed.
4	12 June -10 July	1	Turkey	The investigation and coordination were undertaken on the site of hydropower projects in Anamur.
5	5-23 Aug.	3	Turkey	The confirmation of technical schemes and the negotiation of technical agreements and commercial contracts of OSMANCIK and KALE Hydropower Projects were fulfilled. The visits were also paid to some old and new customers for potential cooperation.
6	18-29 Sept.	2	Turkey	The technical exchange and on-site guidance were undertaken for MURAT I & II Hydropower Projects, and the visits were paid to CAMLICA-III and SARACBENDI Hydropower Stations for on-site investigation.
7	25 Sept. -	2	Turkey	The confirmation of technical schemes and the negotiation of technical agreements and commercial

	14 Oct.			contracts of Binek , Kemercayir, Uchanlar, Ucharmanlar Hydropower Projects were fulfilled. Visits were also paid to AKFEN Company and some other customers.
8	28 Nov. - 10 Dec.	2	Turkey	The negotiations of commercial contract and technical agreement were made for BAGISTAS Hydropower Project and the technical coordination with the owners and the design company was undertaken for the KEMERCAYIR, UCHANLAR, and UCHARMANLAR projects. Visits were also paid to RENAISSAICE and ENDA companies.
9	10 Dec.- 9 March 2011	3	Turkey	The on-site guidance for equipment installation was offered for MURAT-I and MURAT-II Hydropower Projects.

### Appendix 3

#### Papers Published in 2010

No.	Title	Magazine	Serial No.	Category	Author
1	Study on the Mechanism to Benefit Farmers during Refurbishing Rural Hydropower Stations	<i>China Water Resources</i> , No. 14, 2010	ISSN1000-1123 CN11-1374/TV	Domestic core journal in Chinese	Cheng Xialei Fan Xinzhong Lu Xiaoping
2	Thoughts on Reform of Scientific Research Institutions of Public Benefit	<i>Water Resources Development Research</i> , No. 9, 2010	ISSN 1671-1408	Domestic ordinary journal in Chinese	Cheng Xialei
3	About Safety Guarantees for Rural Hydropower in China	<i>Small Hydro Power</i> , No. 2, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Xu Jincui Zhou Lina
4	Application of Containerized SHP	<i>Small Hydro Power</i> , No. 2, 2010	ISSN 1007-7642	Domestic ordinary	Xu Wei

	Station in Technical Rehabilitation of Old Hydropower Plants			journal in Chinese	
5	Research on Complementary Adjustment System between Hydropower and Wind Power	<i>Small Hydro Power</i> , No. 2, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Jin Huapin Dong Dafu Xu Jincai
6	Application of Simplorer in Complementary Adjustment System between Hydropower and Wind Power	<i>Small Hydro Power</i> , No. 2, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Zhang Wei Dong Dafu Xu Jincai
7	On-site Analysis and Treatment on Failures of High-speed Horizontal Francis Turbine-generating Unit	<i>Small Hydro Power</i> , No. 2, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Wang Xiaogang
8	Paying Attention to the Impact of Public Opinions on SHP Development	<i>Small Hydro Power</i> , No. 5, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Cheng Xialei
9	Technical Development and Norm Revision of Leakage Current Protector for Rural Power Grid	<i>Small Hydro Power</i> , No. 3, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Zhu Mingjuan
10	Calculation for Selection of Neutral Point Equipment of Generator in Thai An SHP Station in Vietnam	<i>Small Hydro Power</i> , No.5, 2010	ISSN 1007-7642	Domestic ordinary journal in Chinese	Jiang Xingfen
11	Considerations on Short-circuit Current	<i>Small Hydro Power</i> , No.6, 2010	ISSN1007-7642	Domestic ordinary	Jiang Xingfen

	Calculation in Three Phase AC System in Medium and Small Sized Hydro Power Station			journal in Chinese	
12	Core Technology and Prospect of Energy-saving Meter in Power Grid	<i>Small Hydro Power</i> , No.6, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Zhu Mingjuan
13	Optimal Design of Automatic Control of Cooling Water Supply in Song Quang SHP Station in Vietnam	<i>Small Hydro Power</i> , No. 5, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Zhu Mingjuan Yao Zhaoming
14	Design of Diaoluohu-II Hydropower Station	<i>Small Hydro Power</i> , No. 5, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Yan Jun
15	Application of Communication Server Based on Modbus/TCP Protocol	<i>Small Hydro Power</i> , No.6, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Hu Changshuo
16	Calculation for Design Runoff in Pakkat SHP Station	<i>Small Hydro Power</i> , No.6, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Rao Dayi
17	Empirical Study on Property Right Policy of Rural Hydropower Project	<i>China Rural Water and Hydropower</i> , No. 3, 2010	ISSN1007-2284	Domestic core journal in Chinese	Yao Yuelai Zhao Jianda
18	Key Issues in SHP Investment	<i>Small Hydro Power</i> , No.6, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Chen Kaijun Lu Jianping

19	Refurbish Rural Hydropower and take the road of Sustainable Development	<i>Small Hydro Power</i> , No.2, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Liu Zhongmin Lin Xuxin, etc.
20	Quality Control of Steel Gate Fabrication and Installation in Canal System	<i>Small Hydro Power</i> , No.4, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Wang Yanjun Zhou Jianxiong
21	Research on Intelligent System of Hydropower	<i>Small Hydro Power</i> , No.4, 2010	ISSN1007-7642	Domestic ordinary journal in Chinese	Zhou Zhizhi Yuan Yue Xu Jincai
22	Effects of Wenchuan Earthquake on Yele Dam	<i>ROCK AND SOIL MECHANICS</i> , No.11, Vol.31, 2010		Paper collected in SCI, EI and ISTP	Cao Xuexing He Yunlong Xiong Kun Liu Bin