From:	Patrick Corser
To:	jamesmeaney@lowerchurchillproject.ca
Cc:	amanzer@casselsbrock.com; Kapoor, Anoop; gbennett@nalcorenergy.com; Howard Lee; pharrington@lowerchurchillproject.ca; JANEGA, RICHARD; xmartis@fasken.com; SMITH, LOIS; Boudreau, Anne: IC; Derrick Penman; John Wood; Ryan Chiew; Nikolay Argirov; Mario Finis
Subject:	RE: Nik Argirov / MWH
Date:	Saturday, May 2, 2015 3:40:29 PM
Attachments:	.png .png .png Derrick Penman CV.pdf image001.png image002.png

Jim and Lois,

In light of Nik Agirov's pending departure from MWH, I have met with my colleagues regarding MWH's plan for support to both Emera and Nalcor with ongoing Independent Engineering (IE) services for the Lower Churchill Project (LCP). We are proposing that Derrick Penman will be the MWH Project Manager for our IE services. We expect to engage Nik Agirov as a subcontractor to support Derrick with historical knowledge on the project and with ongoing technical evaluations, if required.

Derrick has been involved with the project in the past and was listed as a Key Individual in our proposal and in both contracts. Derrick is based in the Toronto area. I have asked Derrick to come to Vancouver this coming week to spend time with Nik to facilitate knowledge transfer. This effort will be at MWH's expense. I will coordinate with Derrick to arrange a conference call with this team as part of his time in Vancouver. Derrick's contact details are listed below and an abbreviated CV is attached.

MWH is committed to providing services to both Nalcor and Emera that are consistent with items outlined in your e-mail below.

If you have any questions, please feel free to contact Derrick or myself.

Regards,

Pat

[IMAGE]

cid:image001.png@01CEE07B.AB4D6B60

MWH Canada

Patrick Corser, PE

Country Manager – Canada

Senior Vice President

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1185 West Georgia St., Suite 740

Vancouver, BC V6E 4E6

Canada

From: JamesMeaney@lowerchurchillproject.ca [mailto:JamesMeaney@lowerchurchillproject.ca]

Sent: Thursday, April 30, 2015 7:31 AM

To: Patrick Corser

Cc: amanzer@casselsbrock.com; Kapoor, Anoop; GBennett@nalcorenergy.com; Howard Lee; PHarrington@lowerchurchillproject.ca; JANEGA, RICHARD; xmartis@fasken.com; SMITH, LOIS; Boudreau, Anne: IC

Subject: RE: Nik Argirov / MWH

Hello Patrick,

Following the various communications last week, Nalcor, Emera and Canada have discussed this matter further. We thought it would be beneficial for all parties involved to establish the principles outlined below in order to ensure clarity with respect our collective requirements for the continued provision by MWH of IE services to the Lower Churchill Project and the Maritime Link. We look forward to hearing from you on the arrangements that will be put in place in order to meet these principles. If you have any questions by all means let us know.

Regards,

Jim Meaney (Nalcor) & Lois Smith (Emera)

Principles for MWH Provision of Independent Engineer (IE) Services to the Lower Churchill Project and Maritime Link

- MWH shall ensure that service levels are not reduced and that there is continuity of experienced and qualified personnel acceptable to Nalcor/Emera/Canada, with particular emphasis on the individual responsible for leading the MWH IE team through the Phase 2 - Construction Period scope of work.

- The services provided by MWH must be carried out by a person or persons acceptable to Nalcor/Emera/Canada who is/are highly qualified and experienced in the overall assessment of large scale, northern climate Hydro Electric and Transmission Projects, including coordination, scheduling and project integration. Staffing is to be consistent with recent past practice because this has evolved into an efficient and timely IE review process.

Cost of services provided by MWH cannot be changed without the approval of Nalcor/Emera, including as a result of any personnel changes or additional levels of review and assessment.

The processes; reporting format, contents and style; and the timelines established under the Project Finance Agreements for IE review of the Construction Reports, Funding Requests and related documentation to facilitate issuance of the monthly Draw Confirmation Certificates cannot be changed or negatively impacted in any manner.

MWH have been and continue to be responsible for all internal quality control at no additional cost to the Client and without impact on the timeline for delivery.

MWH liabilities and insurance requirements are unchanged from those agreed to in the original IE agreements with Nalcor/Emera and subsequent IE reliance agreements involving Canada.

This is a long term engagement and relies on continuity of MWH qualified and experienced personnel who are familiar and knowledgeable with the Project, the sensitivities involved given the various key stakeholders, and Project personnel. There is no issue with using contracted personnel provided they meet the specified criteria (we note several engineers involved to date have been contracted by MWH).

MWH are responsible for staffing to meet these principles without increasing costs or negatively impacting the services provided as determined by Nalcor/Emera/Canada.

James Meaney

General Manager Finance

PROJECT DELIVERY TEAM

Lower Churchill Project

t. **709 737-4860** c. **709 727-5283** f. **709 737-1901**

e. **JamesMeaney@lowerchurchillproject.ca**

w. **muskratfalls.nalcorenergy.com**

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

From: Patrick Corser <Patrick.G.Corser@mwhglobal.com>

To: "JamesMeaney@lowerchurchillproject.ca" <JamesMeaney@lowerchurchillproject.ca>,

Cc: "xmartis@fasken.com" <xmartis@fasken.com>, "amanzer@casselsbrock.com" <amanzer@casselsbrock.com>, "GBennett@nalcorenergy.com" <GBennett@nalcorenergy.com>, "PHarrington@lowerchurchillproject.ca" <PHarrington@lowerchurchillproject.ca>, "JANEGA, RICHARD" <RICHARD.JANEGA@emera.com>, "Kapoor, Anoop" <Anoop.Kapoor@NRCan-RNCan.gc.ca>, Howard Lee <Howard.E.Lee@mwhglobal.com>

Date: 04/24/2015 03:21 PM

Subject: RE: Nik Argirov / MWH

Jim,

Thanks for taking my call this morning. As I indicated on the phone, we are developing a plan to support Nalcor and Emera with a transition that will preserve our institutional knowledge on the project. This will include utilizing named individuals in the contract that have been engaged in the project in the past and with support from Nik. I will respond again next week with more details, once we have finalized our plan.

Thanks again and I look forward to speaking with you next week.

Regards,

Pat

cid:image001.png@01CEE07B.AB4D6B60

MWH Canada

Patrick Corser, PE

Country Manager – Canada

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Canada

From: JamesMeaney@lowerchurchillproject.ca [mailto:JamesMeaney@lowerchurchillproject.ca]

Sent: Friday, April 24, 2015 9:44 AM

To: Patrick Corser

Cc: xmartis@fasken.com; amanzer@casselsbrock.com; GBennett@nalcorenergy.com; PHarrington@lowerchurchillproject.ca; JANEGA, RICHARD; Kapoor, Anoop

Subject: Nik Argirov / MWH

Hello Patrick,

Hope this finds you well. I understand Nik Argirov has recently advised MWH of his intentions to leave the company, and as part of that he has offered to continue on as the Independent Engineer (IE) for the Lower Churchill Project through some form of contract or consulting arrangement. I was provided your contact information to follow up on this matter.

As I am sure you can appreciate, the Lower Churchill Project involves many significant stakeholders including the proponents Nalcor Energy and Emera; the Governments of Canada, Newfoundland & Labrador and Nova Scotia; and many large global contractors. Since Nalcor engaged MWH in August 2012 to act as the IE, Nik has taken the lead role for your organization and has come to understand and appreciate the dynamics of this very large and complex project. In the case of Nalcor, we are in the midst of major construction on all fronts of the project and having Nik continue on is this capacity for at least the duration of Phase 2 of the IE work scope, as opposed to starting over with someone new, is of significance. As result, we would certainly see this as being a requirement to Nalcor providing consent in accordance with Article 5.0 (Personnel) of the IE agreement.

If you would like to discuss this matter further, by all means feel free to give me a call. We look forward to a continuation of the positive working relationship between MWH, Nalcor and the Government of Canada.

Regards,

Jim

James Meaney

General Manager Finance

PROJECT DELIVERY TEAM

Lower Churchill Project

t. **709 737-4860** c. **709 727-5283** f. **709 737-1901**

e. **JamesMeaney@lowerchurchillproject.ca**

w. **muskratfalls.nalcorenergy.com**

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

Derrick **Penman**, PEng

Civil/Structural Engineer

MWH

AREA OF EXPERTISE

Civil/Structural Engineering

LOCATION

Toronto, Ontario, Canada

EDUCATION

BS, Civil Engineering, Heriot-Watt University

PROFESSIONAL REGISTRATION(S)

Professional Engineer – P.Eng. APEGBC, PEGNL, APENS, NAPEG, PEO

YEARS OF EXPERIENCE

44

SUMMARY:

Mr. Penman is a Hydropower Engineer with experience in the layout and design of hydroelectric plants at prefeasibility, feasibility and detailed design levels both in Canada and internationally. He has also been involved in dam safety assessments and due diligence assessments of hydroelectric projects for financial institutions. His most recent experience includes ranking and feasibility studies, tender design through to construction, review of design concepts, due diligence work, and construction supervision.

RELEVANT PROJECT EXPERIENCE:

Genale-Dawa 3 (GD3) Hydroelectric Project, *Ethiopian Electric Power (EEP)*
Technical Manager, responsible for coordination between various disciplines in the review of the Contractor's designs, drawings and specifications to ensure conformance with the Owner's Requirements. The project, which is currently under construction, lies 400 km south of Addis Ababa, close to the borders with Somalia and Kenya. The main components of the project are a 110-m-high concrete faced rockfill dam, 12 km of unlined headrace tunnel 8.4-m-dia., 750 km of concrete and steel lined high pressure tunnel, 4.8-mdia, 130 m of concrete lined tailrace tunnel and a semi underground powerhouse containing three 85 MW Francis units. The reservoir has a total storage of 2,570 million m^3 with a carry-over storage capability.

Dam Safety Inspections, *City of Nanaimo Water Supply Dams, British Columbia, Canada*
Dam Safety Engineer responsible for carrying out dam safety assessment of the dam and ancillary structures for the City of Nanaimo Main Water Supply Reservoirs ; underwater inspection supervision; coordinating with the geotechnical engineer for review of instrumentation data for the dam to identify trends of increased seepage and dam settlement and performance expectations (including flood and earthquake criteria); review of available documents for conformance with dam safety requirements; determination of dams' conformance with set of dam safety expectations; identification of additional dam safety requirements for risk management appropriate to international practices; review of O&M manuals and EPP for conformance to CDA guidelines; and preparation of Dam Safety Report.

Yahwei-Urumuka Hydroelectric Power Plant Project, *Papua Power, Indonesia*
Project Engineer responsible for the engineering aspects of a definition study for Papua Power Indonesia for a hydroelectric scheme in the order of 400 MW, comprising a power tunnel intake, some 2.2 km of power tunnel, and approximately 1 km of twin steel penstocks, leading to a surface powerhouse. The site is located in virgin jungle some 100 km northwest of Timika in the Province of Papua, Indonesia. The study also includes a transmission line study for evacuating power to the main customer, a large international mining facility located nearby Timika.

Taltson Expansion Project, *NWT Energy Corporation (03) Ltd*
Project Manager for the preparation of a definition study for Taltson Hydroelectric Expansion Project to add a new power plant of approximately 50MW install capacity and 700km transmission lines to supply power to as many as three operating and one proposed diamond mines north of Great Slave Lake.

White River Hydro Project, *Regional Power OPCO, Inc.*
Mr. Penman was the project manager for the Detail Design Phase of the project. The White River hydro project is a joint venture of Regional Power Inc. (a subsidiary of Manulife Financial) with Pic Mobert First Nation. There are two separate dam sites Gitchi Animki Bezhig (Upper) and Gitchi Animki Niizh (Lower) that are located 10 Km from each other, both are "greenfield" projects. The project uses a 21 km new transmission line and has combined total design capacity of 18.9 MW. The White River project is currently under construction and is expected to be in operations during late 2015

Oskan and Berkman Hydroelectric Plants, *Turkey*
Carried out a technical due diligence for a major developer in the US who was planning to purchase a share in two hydroelectric power projects (HEPPs) under construction on the Ceyhan River in southern Turkey. The two projects: (1) 25-MW Oskan Weir HEPP, and (2) 35-MW Berkman Weir HEPP are located on the stretch of the Ceyhan River between the existing Aslantas Dam upstream and Cevdetye Irrigation project downstream, about 14 km northwest of the town of Osmaniye in Adana Province. The Oskan and Berkman projects are near the village of Karagedik and Sarpinagzi, respectively. The two projects are run-of-river type projects and feature very similar project components as outlined below: Homogeneous fill type dam approximately 14m high. Controlled spillway with four radial gates 3-bulb type turbines 23-m by 45-m powerhouse building.

Finchaa-Amerti-Neshe (FAN) Multipurpose Project, *Ethiopian Electric Light and Power Authority*
Responsible for coordination between various disciplines in the review of the Contractor's designs, drawings and specifications to ensure conformance with the Owner's Requirements for the multipurpose (hydropower and irrigation) FAN Project. The project is being constructed under an EPC contract, near the town of Finchaa in the Nile basin in Ethiopia. The main components of the project are a 38-m-high homogeneous earthfill dam, a shaft spillway, power intake and bottom outlet combined in a single structure, a 3.6-km-long power conduit system including 2.7-m-diameter concrete pipe, 2.7-m-diameter low-pressure concrete lined tunnel, 2.6-m-diameter high pressure tunnel, steel lined tunnel and 2.1-m-diameter steel penstock, and a surface powerhouse containing two vertical axis impulse units with an installed capacity of 97 MW and a switchyard. The dam impounds a reservoir with a capacity of 448 million m^3, a dead storage of 85 million m^3 and a live storage of 363 million m^3. Work involves regular visits to the site and to the Contractor's head office in China to review the Contractor's design progress and to resolve design issues as they arise during construction. Main features of the project are the design of the tunnel liners to suit the poor rock conditions (in mudstone) along sections of the high pressure tunnel route and in the 200-m-high pressure shaft, the stability of the thrust blocks in the high pressure penstock in the deep overburden cover on the slopes above the powerhouse and the design of the cut-off beneath the dam in the deep overburden cover.

Waneta Expansion Project, *Peter Kiewit & Sons, British Columbia, Canada*
Responsible for the coordination between the various engineering disciplines in the preparation of the design of the 335 MW expansion to the existing Waneta Hydroelectric Project on the Pend d'Oreille river in British Columbia for an EPC bid submitted by Peter Kiewit & Sons a major North American civil engineering contractor. The Waneta Expansion project is located on the right abutment of the existing facility. The layout comprised two separate power intakes, located adjacent to the existing north closure wall, two lined tunnels with a diameter of 10 m for the concrete section and 8.3 m for the steel lined portion upstream of the powerhouse and a powerhouse located some 80 m downstream of the existing dam containing two vertical axis Francis units. Water is conveyed from the existing reservoir to the power intakes through a 185-m-long unlined channel excavated in rock and overburden. The inlet to the approach channel is located approximately 40 m upstream of the existing intake.

Tekeze Hydropower Project, *Ethiopian Electric Power Corporation*
As Chief Design Engineer, responsible for supervision of the design activities at site including re-design of elements of the project where site conditions vary from those assumed during the initial design phase, review of contractor's shop drawings, review of method statements, temporary works designs, and other technical submissions from the Contractor. The project comprises a 185-m-high double curvature arch dam containing four orifice type outlets to handle a flood of 4500 m^3/sec after routing through the reservoir. Power flows are conveyed to a 4-unit underground powerhouse with an installed capacity of 300 MW through a f 7.25-m- 320-m-long concrete lined headrace tunnel, a f 6.75 m pressure shaft leading to a concrete lined manifold which branches to 4 steel lined tunnels f 4.0 m varying in length from 76 m to 52 m. Flows are discharged to the river through 55-m-long concrete lined D-shaped tunnels with an equivalent diameter of 5.0 m.

Slave River Project, *TransCanada Energy*
Hydroelectric planning and feasibility studies on the Slave River in Northern Alberta. Studied alternative project configurations to avoid inundation of 1st Nations Land including a reduced installed capacity from the 1,200 MW reservoir project originally studied by Shawinigan-Stanley.

Peace River Hydroelectric Development Project, *TransCanada Energy*
In 2007 as part of a review of the hydroelectric generation potential of the major rivers in the northwestern regions of Alberta by TransCanada Energy, MWH carried out a screening study from which several

potential sites were identified. From this screening study the P2 site, located approximately 136km downstream of the town of Peace River was selected for site reconnaissance and pre-feasibility study of a 700MW development. Mr. Penman led the team who prepared the study which involved, preliminary design of an RCC dam and gated spillway and a close coupled 7-unit Kaplan unit powerhouse, construction and logistics planning and preparation of a Class 5 estimate.

Misema Hydroelectric Project, *Green Energy Developers, Toronto, Canada*
Project manager for the 3 MW Misema Hydroelectric Project, near New Liskeard Ontario during the preparation of the final engineer's estimate, application documents for construction approval and the preparation of the bid documents for the procurement of the electromechanical equipment. The project layout comprised a low concrete weir to divert water into an intake and power waterway through a ridge to develop the available head at a series of rapids in the Misema River. The project was located in an area of deep unstable sands prevalent along the banks of the Misema river and after studying various options the f 0.9 steel penstock was located below the sand in a f 2.6 tunnel constructed through the underlying rock and the intake adapted to a dropshaft type. The surface powerhouse contained 2-horizontal Francis units.

High Falls Hydroelectric Project, *Beaver Power Company, Canada*
Project Manager for the studies carried out for the rehabilitation of the 3 MW High Falls Hydroelectric Project, north of Thunder Bay, Ontario. The project comprised some 30 m of woodstave penstock leading from a power intake at the head of a set of rapids in the High Falls River to a single horizontal axis Kaplan unit. The project had flooded during the spring freshet some years before. The remedial measures included: redesign of flood protection walls; design of access walkways inside; rehabilitation of the generator and controls damaged during the flood; and preparation of a budget cost estimate for the Client.

Karun III Hydroelectric Project, *Iran Water and Power Development Corporation (IWPC)*
Responsible for providing advisory services to the joint venture of Acres and their local Iranian partner Mahab Godss on the construction supervision of the Karun III Hydroelectric Project in a joint role as Design Manager and Area Engineer for the Plunge Pool and Underground Power Complex. The project comprises a 205 m high concrete arch dam, spillway facilities to handle flows of 21,440 m^3/sec and underground works, which comprise an 8-unit underground powerhouse (installed capacity 2,000 MW), and an underground transformer gallery. Flows for power generation are conveyed through penstock tunnels approximately 700-m-long and varying in size from 12.6-m- to 5-m-diameter. As Design Manager responsible for managing and coordinating the efforts of the design team, which reviewed design changes proposed by the contractors, temporary works designs, and other technical submissions. An area engineer for the plunge pool and underground works coordinating the construction supervision.

Supplementary Studies for the Upper Karnali Hydroelectric Project, *Canadian International Development Agency (CIDA)*
Project Manager for the supplementary studies for the 300 MW Upper Karnali Hydroelectric Project in Nepal carried out in preparation for construction approval submissions. The feasibility study was initially carried out by Acres under the Medium Hydro Study Project funded by the World Bank. The supplementary studies involved the EIA and cadastral surveys for 100 km of 220 kV transmission line, EIA and cadastral survey for 22 km of access road between the intake and powerhouse, Glacial Lake Outburst Flood (GLOF) studies, investigation of new headworks layout and supplementary hydraulic studies for the lower reaches of the Karnali River to determine the effect on aquatic habitat. This work was suspended in the initial stages due to political problems in the country.

Vishnupryag Hydroelectric Project, *ICICI Bank – Mumbai, India*
Responsible to the ICICI Bank in Mumbai India for the for coordinating work carried out by a team of experts on the design review and construction monitoring for the 400-MW Vishnupryag Hydroelectric Project in Utteranchal State. The project comprises a three-gated barrage intake; two- underground desilting chambers, approximately 200 meters long; 11 kilometers of concrete lined headrace tunnel with 4.0 meter diameter; an inclined pressure shaft 1.1 kilometers long varying in diameter from 3.5 to 3.3 meters; a 7-meter diameter surge tank, steel lined penstock tunnels and manifold, varying in diameter from 2.5 meters to 1.85 meters; and an underground powerhouse 122 meters long and 18.7 meters wide housing four Pelton units and an underground transformer cavern, 103 meters long and 14.2 meters wide. The work was carried out, initially from Acres head office and later from the office of Acres subsidiary, Mahindra- Acres in Chennai, India, with regular visits made to the construction site. The barrage was located in a narrow valley with restricted space available for diversion and was founded on

deep alluvial material. Extensive scour protection measures were required to prevent undermining of the structures but no major measures were adopted for under-seepage control, other than shallow cut-offs located upstream and downstream. The staged diversion scheme adopted for construction of the barrage successfully protected the works against a large flood (50 percent of the 1:50 year design flood) during construction and the partially completed barrage structure performed well. Rock mechanics related design issues raised during the design review with the power tunnel design and the underground desander design were addressed through design modifications implemented by the contractor.

Ethiopia Long-Range Generation Plant, *Ethiopian Electric Power Corporation (EEPCO)*
Hydroelectric Specialist on the Ethiopia Long-Range Generation Plan for EEPCO funded by the African Development Bank. Responsible for bringing cost estimates for candidate projects at different levels of study to a common base for input into the planning model. Projects included the Chemoga Yeda, Beles and Halele Werabasa projects, which are currently in the design stage.

Brilliant Dam Expansion Studies, *Columbia Power Corporation*
Project Engineer responsible for the conceptual studies for the 100-MW Brilliant Dam Expansion Studies on the Kootenay River in British Columbia. The conceptual studies formed the basic technical information to be included with EPC documents. The work involved preparation of layouts and cost estimates for surface and underground options for the addition of a new powerhouse, with a single Kaplan turbine to capture spill flows at an existing dam and power installation. The work included investigations of options for disposal of spoil from the excavations to satisfy strict environmental regulations on what was an important salmon river in British Columbia.

Addalam Hydropower Project, *ConWest Exploration Co. Ltd. of Canada*
Modifications to the layouts and preliminary design of component structures for a build-operate-transfer (BOT) bid on the 46-MW Addalam hydropower project in the Philippines.

Birr and Koga Irrigation Project, *Ethiopia Ministry of Water Resources*
Preparation of layouts and preliminary design of hydraulic structures for the 320,000-ha Birr and Koga Irrigation project in Ethiopia.

Screening and Ranking of Medium Hydropower Study Project, *NEA (Nepal Electricity Authority)*
Project Manager for the feasibility studies and Project Engineer for the screening and ranking phase of the Medium Hydropower Study project, Nepal. The first phase of the project involved the screening and ranking of 138 projects defined as medium-scale in the Nepal context to lie in the range from 10 MW to 300 MW. From the 138 projects seven projects were selected for full feasibility study and environmental impact assessment study, through a coarse and fine screening process, using both environmental and technical parameters. The MHSP team carried out three of the studies, namely 300-MW Upper Karnali, 300-MW Dudh Koshi and 100-MW Tamur-Mewa. Local consultants under the supervision of the MHSP team carried out the remaining four in the 10-MW to 50-MW range, namely Rahughat, Likhu, Budhi Ganga and Kabeli A. The Upper Karnali Project comprises a gated barrage type intake (3- to 12-m-high by 12-m-wide gates) and large desanding structure (190 m^3/sec flow), approximately 2 km of power tunnels ranging in diameter from 11 m for the unlined headrace tunnel to 8.0 m and 6.0 m for the concrete lined and steel lined respectively, an underground surge shaft and underground powerhouse with four Francis units. The Dudh Kosi Project features a 180-m-high zoned fill dam and approximately 11 km of power tunnels with a range of diameters of 11 m to 6 m depending on the lining condition and an underground powerhouse housing four Francis units. The remaining projects have similar layouts comprising a free overflow concrete weir, desanding structures power tunnels and underground powerhouses.

Ranking Study of 30 Potential Hydroelectric Sites in the Upper Indus, Jhelum, and the Swat/Chitral/Kabul Basins, *Water and Power Development Authority (WAPDA), Pakistan*
Conducted Pakistan hydroelectric inventory and ranking study of over 30 potential hydroelectric sites in the Upper Indus, Jhelum, and the Swat/Chitral/Kabul basins in northern Pakistan, each having an annual energy potential in excess of 1000 GWh. Sites included Basha (dam height 200 m, installed capacity 3360 MW), Dasu (235 m, 2400 MW) and Thakot (60 m, 2400 MW). Responsibilities included identification and reconnaissance of potential sites with emphasis on foundation conditions and availability of construction materials, preliminary design, preparation of project layouts and cost estimates.