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# TRIP REPORT

SINGAPORE

MALAYSIA

THAILAND

INDONESIA

FEBRUARY 24 - MARCH 19, 1977



*Canada Dept of.*

Industry, Trade and Commerce, Industrie et Commerce

CAPITAL PROJECTS BRANCH

APRIL 1977

## T R I P   R E P O R T

SINGAPORE, MALAYSIA, THAILAND, INDONESIA

February 24 - March 14, 1977

### INTRODUCTION

The purpose of the trip was as follows:

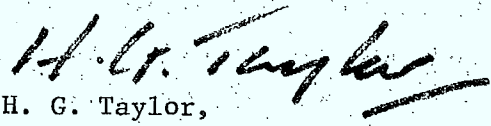
- a) To participate in the SEATEC port and dredging seminar and exhibition in Singapore. Departmental involvement in the form of an information booth had been sponsored and organized by the Infrastructure Projects Division, in co-operation with the OEPS and the post.
- b) To carry out market identification and promotional activities in South East Asia as part of the Capital Projects Branch ongoing project marketing strategy.

Hong Kong and the Philippines were not visited since the whole of South East Asia cannot be adequately covered in one broadly-based, marketing trip of the normal three week duration.

This is the author's third marketing trip to South East Asia (SEA). Previous visits which were centered on developing the Indonesian market were made in October 1972 and November 1975.

The Infrastructure Projects Division of the Capital Projects Branch is responsible for project marketing in the Transportation, Power and Communications sectors, and pursuit of these projects was consequently the prime objective. Further objectives were to assess gas and oil developments in SEA in order to make recommendations on departmental marketing initiatives in this sector for fiscal 1977/78, and to follow up on the large soda ash project in Thailand for which two Canadian consultants have been shortlisted.

This report is presented in the form of project and sector summaries by countries, as a synthesis of all the available sources of information, rather than in the form of interview reports.

  
H. G. Taylor,  
Assistant Chief,  
Infrastructure Projects Division,  
Capital Projects Branch (71).  
Tel: (613) 992-1084

SINGAPORE - February 27 - March 6, 1977

Meetings were held with:

Mr. D. F. Cooper, Commercial Secretary, Canadian High Commission  
Mr. W.H.C. Chia, Commercial Officer, Canadian High Commission  
Mr. Rod de Luca, Director & Manager, Acquisitions, Bow Valley Exploration (s) Pte. Ltd.  
Dr. Bailey Wong, Acres/NORR Representative, 5 Seah Street, Singapore 7.  
Mr. K. Sorensen, Managing Director, Monenco Asia Pte. Ltd.  
Mr. Patrick Pang, Consulting Engineer, 38 Chu Lin Road, Singapore 23.  
Mr. L. R. Estrop, Consultant, Public Utilities Board, City Hall, Singapore 6.  
Mr. Goh Keng Chew, Assistant Director, Public Works Department, (Airport Branch), Ministry of National Dev. Building, Singapore I.  
Mr. Chung Kek Choo, Director, Management Services, Port of Singapore Authority, Singapore 4.  
Mr. Lang Fong Sek, Catering Manager, Singapore Airline Terminal Services (SATS), Paya Lebar Airport  
Mr. Chan Peng Ann, Chief Planning Officer, SATS, Paya Lebar Airport.

As pointed out in the Introduction, the primary objective of the visit to Singapore was to attend SEATEC. Since a colleague from the Transportation Industries Branch, Mr. Slavic Skorupinski, was also present, I had the opportunity to pursue a number of other business interests in Singapore whilst still working at the Canadian booth for a portion of each day. A joint report on SEATEC by Messrs. Skorupinski and Taylor is appended following page 7. The following are notes on meetings held outside SEATEC.

#### GAS AND OIL

Discussions were held on the overall gas and oil scene in SEA with Mr. Rod de Luca of Bow Valley Exploration(s) Pte. Ltd. Bow Valley's interests extend from oil and gas to hard rock mining and pulp and paper. In addition to doing exploration work, they are looking for concessions and have 23 service divisions working all over the world. The service activity is in high demand in SEA since the development of gas and oil resources in the area is receiving

*This is from Canadian who had you find out from the people of Singapore*



very high priority in all countries in the region. However, as an exporter of goods and services, Bow Valley needs government assistance in financing and marketing in SEA. Mr. E. Seaman, President of Bow Valley, is due to visit SEA in April to get an overview of the market. Mr. de Luca is preparing a comprehensive analysis of the gas and oil prospects in SEA countries, together with economic assessments and regulatory and legal factors affecting the business climate.

In response to my question on the most attractive areas for future development in the gas and oil sector, Mr. de Luca mentioned the following:

1. Malaysia - offshore, east and west coasts.
2. Indonesia - exploration incentives are being re-introduced.
3. Australia - the climate has improved significantly since the change in government. Bow Valley are seeking concessions.
4. Vietnam - Bow Valley trying to re-acquire rights previously held and are working with Petrocan. Vietnamese visiting Calgary early April for negotiations.

#### POWER

Discussions were held with Mr. Ken Sorensen, Managing Director of Monenco Asia Pte. Ltd. and later with other members of the Monenco team working on the Senoco power station when a visit was made to the site with Mr. Sorensen and Mr. Dave Cooper, Commercial Secretary, on Saturday, March 19.

Monenco is the design consultant and construction supervisor on the Senoco oil-fired power station of the Public Utilities Board. Phase I of this station, which is virtually complete, comprises 3 x 120 MW units supplied by Hitachi, a licensee of B & W boilers and GE turbines, as sub-contractor to the Japanese trading company, C. Itoh. Phase II, for which all contracts have been let to the same suppliers, comprises 3 x 250 MW units. The boiler steel work for Phase II was in the process of erection at the site. Scheduled completion is the end of 1979. The master plan for Senoco includes a Phase III comprising another 2 or 3 x 250 MW units which could be authorized in 1978. This would result in the total installed capacity of the station of up to 1,860 MW. There is, however, some question as to whether the third phase will be built (see discussion with Mr. Estrop of PUB). Also installed at the Senoco station are 2 x 25 MW gas turbines which were purchased as turnkey packages from Hitachi.

*Some comments.*



The only significant Canadian-built equipment in the station is the Bailey Meter Canada electronic boiler control system, which Monenco strongly recommended to the PUB.

The Senoco station is an excellent example of adaptation of state of the art North American practice to optimize the design of a large power station in a tropical climate. Everything about it looked right to me, and Monenco's continuing good relations with the PUB should ensure them a continuity of work in Singapore for many years. It was apparent in talking to the utilities in Malaysia, Thailand and Indonesia that Monenco's work on Senoco is highly regarded and Monenco is actively marketing their services in Malaysia and Indonesia (see Power reports on these countries).

Discussions were also held with Mr. L. R. Estrop, Consultant, PUB, who has recently retired from being Chief Engineer of PUB and was a member of the Incoming SEA Power Mission in 1975. Mr. Estrop is retiring altogether from the PUB in November, 1977, and gave me the impression that he would like to involve himself with Canadian companies working in Singapore and SEA. He made a number of useful points:

- It is possible that the Phase III of Senoco may not be built due to environmental problems which could arise from such a large station, including the effect on Malaysia, a short distance across the Straits. If a new station is built, it would open up the market for Canadian equipment suppliers (particularly boiler manufacturers) to bid. As long as Senoco continues to be expanded it is likely that they will standardize on Hitachi equipment.
- Mr. Estrop expressed particular disappointment that after his visit to Canada, ITE had not followed up on their requirements for SF6 indoor sub-station switch gear as an alternative to Alsthom of France. On checking this point, it appears that shortly after Mr. Estrop's visit ITE decided to concentrate production of this type of switch gear in the USA and it may be a few years before another Canadian source is established.
- Singapore used underground transmission exclusively at 220, 66 and 22 KV with cross-linked polyethylene insulated cable (not oil filled). Cable is being bought from the UK, Japan and Sweden. No Canadian interest has been shown. On checking with E&E Branch, it appears that there are now several sources of this cable in Canada, including Canada Wire and Cable, and Phillips. E&E will alert industry.

- In view of the invasion of the Singapore market by European manufacturers, Mr. Estrop wondered where Canada is. Transformers and switch gear are being supplied by Alsthom (France), Siemens (Germany), Brown Boveri (Switzerland), as well as the Japanese. E&E will alert Canadian suppliers.
- Following the completion of Senoco, a new thermal power station will be required to come on line about 1983. The peak load is now 780 MW.
- Mr. Estrop said that the offer of EDC financing for Senoco equipment in 1972 was late and non-competitive. He said that recently the French have been offering the best financing deals.
- A future project which should be of interest to Canadian consultants is the proposal for electrical interconnection between Singapore, Sumatra and Malaysia, possibly submarine DC (see Power - Indonesia).

Further discussions on power were held with Mr. Patrick Pang, formerly Chief Planner and Design Engineer, PUB, and now a private consultant. Mr. Pang also was a member of the incoming power mission in the fall of 1975. He told me that Alsthom, as the sole supplier of HV switch gear and transformers to the PUB, have had \$300 M worth of contracts in the last ten years. Mr. Pang is now assisting with the commissioning of Alsthom's most current installation at Senoco and recently took part in a Teshmont-sponsored presentation to PLN, the Indonesian utility on DC transmission in association with Monenco Asia (Pte) Ltd.

Mr. Pang is pro-Canadian, technically oriented, and would be prepared to assist Canadian companies in the SEA market by advice, market studies or recommendations for agents, etc.

#### CIVIL AVIATION

Discussions were held with Mr. Goh Keng Chew, Assistant Director, Public Works Department, Mr. Chan Peng Ann, Chief Planning Officer, SATS, Mr. Lang Fong Sek, Catering Manager, SATS, and Dr. Bailey Wong, the Acres/NORR agent.

All discussions were related to the new International Airport for Singapore, in the early construction stage at Changi on the site of the former British Royal Air Force Base, which is on the east coast of the island. The

new site, which will be five times the area of the existing Paya Lebar Airport, will have two parallel, 4,000 metre-long runways on partially reclaimed land, and 82 aircraft parking stands. The first runway and passenger terminal are scheduled to be completed in 1980 and the whole project, with a capacity of 20 million passengers per year, by 1982. In 1975, Paya Lebar handled four million passengers. The annual increase is running at about 14%. Singapore has surpassed Hong Kong as the top tourist destination in Asia, and Singapore Airlines is Asia's largest and most successful airline.

We have been following the Changi project for a number of years. Initial master planning was carried out by Northrop, later they withdrew from the civil aviation scene entirely. The most recent master plan was carried out by NACO of the Netherlands. Responsibility for the project is now split with the Department of Public Works having responsibility for the terminal building, runways, etc., and Singapore International Airlines (SIA), through their subsidiary Singapore Air Terminal Services (SATS), for the cargo hangar, flight kitchens and maintenance facilities.

The opportunities for consulting services on the SATS projects are being fully exploited by Canadian consultants. Acres/NORR/Johnson have the contract for the systems design for the new flight kitchen (\$250,000) and are now bidding on the project management contract for the construction phase in joint venture with a local company. The building architecture and detail design work will be carried out locally. The total value of the project is \$52 M and since the system design is Canadian, excellent opportunities for the sale of equipment should develop.

At least two Canadian consultants are expected to bid on the cargo hangar and facilities for which the specifications have not yet been issued. I visited the existing SATS flight kitchen in order to talk to Mr. Lang Fong Sek, the manager, who had visited Canada in November 1976, about the new facility. He informed me that Acres/NORR/Johnson are on schedule with their consulting work and that an award on the project management function could be made as early as the end of March. The award will be made by a committee of four divisional managers of SATS, of which he is one. Mr. Fong also intimated that Singapore International Airlines may be interested in using an international consultant to look after all their interest at Changi vis-a-vis the DPW.



I did not have time to pursue this, but the post ascertained that, in the fall of 1976, SIA invited eight U.S. and three European companies to submit qualifications for project management services. No Canadian firms were invited and the bid closing date was about the end of January.

The key man in SIA on consulting services was said to be Mr. K. Kulasecaram. Unfortunately, I had no opportunity to meet this man.

Mr. Goh Keng Chew of the DPW informed me that his Director, Mr. Yap Neng Chew, was making an extensive tour of Europe and North America discussing planning and project management of large airport projects and expected to visit Canada for two days about Easter. We are now expecting the Director during the period April 11 - 13 and a suitable itinerary has been prepared. It is DPW's intention to carry out all the detail design, construction supervision, purchasing and project management on the airport themselves. NACO have been involved in the master plan but whether or not they are actually under contract to the DPW at this time is uncertain.

Prequalification had been called for major equipment items for the terminal building with Interimco acting as representative for such companies as Canadian Westinghouse, Ferranti Packard, and Robert Mitchell. Mr. Goh Keng Chew stated that the Interimco submission did not give sufficient information on the companies which they were representing and was in imminent danger of failing to pre-qualify. A telex was immediately sent to Ottawa and it is now understood that a comprehensive submission by Interimco on behalf of Canadian suppliers has apparently been accepted by the DPW.

The Department of Communications will be responsible for the procurement of all navigational aids. The baggage handling system is being designed by NACO and tenders will be called in early 1978.

#### PORTS

Discussions were held with Mr. Chung Kek Choo, Director, Management Services, Port of Singapore Authority.

The Authority does almost all of its own planning and design work. Traditionally, Bruce White of the UK have been their consultants. About \$100 M in expansion projects are in the planning stage, requiring about \$10 M worth

of equipment, mainly for container handling. I told Mr. Chung Kek Choo of the incoming Hong Kong Port Traffic Management Mission in Canada at that time and he expressed strong interest in the application of a similar system to Singapore, which has very similar traffic problems to Vancouver. Canadian companies such as ADGA have been alerted and will forward literature. Consideration should be given to inviting Mr. Chung Kek Choo to Canada if sufficient interest is generated.

\* \* \*

FAIR REPORT

SEATEC 77

MARCH 1 - 5

Hyatt Hotel, Singapore

Prepared by: S. Skorupinski  
H. Taylor

Date: March 29, 1977



## INTRODUCTION

The SEATEC 77 seminar and exhibition was sponsored by the United Nations Economic and Social Commission for Asia and the Pacific, and by the International Association of Ports and Harbours. It was organized by the Dredging and Port Construction magazine, a British publication.

SEATEC 77 was held at the Hyatt hotel in Singapore from March 1-5 inclusive. Its theme was "Dredging and Construction of Ports for Developing Countries".

## CANADIAN PARTICIPATION

The Department of Industry, Trade and Commerce sponsored an information booth at SEATEC 77. The booth was continually manned by two officers from Ottawa: Mr. S. Skorupinski, Transportation Industries Branch, and Mr. H. Taylor, <sup>Capital</sup> Special Projects Branch.

Twenty-five Canadian companies were represented and information on each was available for distribution to visitors to the exhibit.

The Canadian exhibit occupied 30' x 12'. It consisted of a central, rectangular, enclosed area for conferences and a reception area. The outer walls were covered with photographs and descriptions of the products and services available from the various Canadian companies. One end wall was devoted to general information about Canada.

The booth was designed and erected by a local company, Campaigns Limited. The design was very good and, while in retrospect some improvements could have been made, the Canadian exhibit was one of the more attractive at SEATEC. No problems were experienced with Campaigns Ltd. during the erection of the exhibit.

## SEATEC 77

SEATEC consisted of a seminar and an exhibition. Each morning a formal papers program was delivered by acknowledged experts from around the world. These papers provided the platform for afternoon discussions.

The exhibition provided the technical and commercial link with the seminar. On display was a variety of dredging and port construction services and equipment necessary for the creation of new ports. Over 60 companies from nine countries were represented with the strongest contingent being from Holland, the home of dredging. Other countries represented were Canada, the U.S.A., Japan and Singapore. Canada had the only national exhibit. A list of all the exhibitors is attached at Annex 'B'. Annex 'A' details the seminar program. Transcripts of the papers presented are available from Mr. Skorupinski.

The focus of the show turned out to be on dredging and port construction, both during the seminar and at the exhibits. The Dutch, who are quite active in the area, were strongly represented.

180 delegates were registered for SEATEC. These came from 30 countries. Representatives of port authorities from India, Indonesia, Malaysia, Singapore, Vietnam, Kenya, Nigeria, Philippines, Thailand, Japan, Australia, New Zealand and Netherlands were in attendance. See Annex 'C' for the full list of delegates.

#### SHOW ANALYSIS

##### a) Booth Design and Location:

The overall design of the booth was quite good. In retrospect, the reception area could have been enlarged at the expense of the conference area, and more space for displaying company literature could have been made available.

The location was not satisfactory. The Canadian booth was not located in the primary exhibit area. We were in the second room, which turned out to be one floor of a parking garage converted to house a number of exhibits. The air conditioning was minimal and the area was some distance from the main exhibit and conference area. As a result, the

traffic flow was substantially reduced and because of the temperature, visitors tended to stay for a short period only. These problems relating to the location of the Canadian booth arose from the late decision by the Department to participate in the fair for by then the prime locations had been taken.

In future shows display areas inside the hotel should be obtained, if possible.

b) Type of Display:

Canada had the only national display at the exhibition. The rest of the exhibits were manned by companies who were already active in the South East Asian market.

Since this was our first exposure to this show, an institutional exhibit was useful in that it established our presence. However, now that we have participated on this basis, our next display should feature companies who are active in, or who are making a serious effort to penetrate the market. The company display should be manned by knowledgeable company representatives. It would be useful to have all Canadian companies located in one space, with some government presence.

c) Seminar

Canadian companies should be urged to present papers at the seminar as this represents a good forum for both exposure and the development of contacts. The seminar turned out to be very successful and drew a large number of delegates. The papers were of a high technical calibre and were well presented.

d) Attendance

Many of the exhibitors were disappointed at the limited attendance during the show. However, others were quite pleased and commented that even though attendance was light, the right people attended the show.



This latter comment is more appropriate as the conference was highly specialized and only attracted certain interested people. Representatives from all port authorities in the area where port development is underway did attend, and certain exhibitors did obtain business at the site.

It appeared that most of the attendees were experts in the field of port development and were familiar with the equipment and services being offered by the various companies, including those in Canada. They did not come to the show for general information, but rather to participate in the seminar program, and meet with specific companies and individuals.

The visitors to the Canadian exhibit were already familiar with companies such as Swan Wooster, FENCO, Sceptre Dredging, Per Hall, Howe and Heede. They had either heard of them, or had some previous contact. In the former case, the show presented them with an opportunity to obtain literature and information on the company; in the latter, they enquired whether a company representative was present. Most of the interest centered on these companies and as a result, their literature quickly disappeared.

Some interest was also shown in the following companies: Canron, Heede, J.T. Hepburn, Skagit and Steadman. Very little interest was shown in the remaining exhibitors.

A great number of agents visited the exhibit.

#### CONCLUSIONS AND RECOMMENDATIONS

1. SEATEC 78 will be held in Manila during September 1978. Canadian participation could be in one of two ways:

- a) send a representative to review the fair to determine whether attendance has increased, whether the stature of the show is growing, and the advisability of future participation;
- b) sponsor a joint government-industry exhibit if industry participation is forthcoming. The number of companies participating should be small and highly selective. Only companies who are either active or seriously interested in the market, and are willing to do the necessary follow-up work should participate.

A decision on whether a) or b) is to be recommended must await a review of the market potential in SEA together with the level of interest being shown by Canadian companies approximately a year from now.

- 2. Another information booth at this show is not warranted.
- 3. Any display should be located in the main exhibit hall.
- 4. Models, in addition to literature, should be on display.
- 5. Companies such as Swan Wooster, FENCO, etc., should be encouraged to present papers, irrespective of whether they are represented at the exhibit.
- 6. The value of a mission to South East Asian countries immediately prior to SEATEC 78 should be considered. Invitations to visit the Canadian exhibit could be issued during the course of the mission.



# **FRIDAY, MARCH 4**

- 09.00** Address of session chairman, Mr. V.R. Mehta
- 09.15** "Defining an assistance strategy for developing countries:  
ESCAP and regional dredging problems"  
Mr. J. Sisselaar
- 09.45** Case Histories: "Dredgers in full swing in the jungle wilderness"  
Mr. Wataru Abe  
"The use of permeable fabric membrane in a simple  
coastal defence structure designed to cope with  
rapidly falling sea-floor level"  
Mr. P.R. Rankilor  
"Problems associated with the development of new  
ports in Jamaica"  
Mr. C.J. Evans  
"Reclamation as a means of creating new ports"  
Mr. Toyotaro Sumida
- 10.45** Coffee Break
- 11.15** Panel discussion
- 13.00**  
approx. Lunch
- 14.30** Panel discussion:  
"The evaluation and selection of equipment and methods available  
for dredging in developing countries"  
Panellists: Ir. J. de Koning; Dr. S.K. Battacharya; Ir. C. de Groot;  
Mr. Toyotaro Sumida;
- 16.00** Concluding paper:  
"An assessment of the SEATEC proceedings"  
Mr. A. Vijjaratnam, Port of Singapore Authority.
- 16.30** Closing Summary:  
Mr. A. Vijjaratnam; Mr. V.R. Mehta and Tuan Haji Mohd. Azuddin bin  
Haji Zainal Abidin
- 20.00** SEATEC BARBEQUE — Hyatt Poolside, 4th floor  
(Islander, 1st floor if raining)

# **SATURDAY, MARCH 5**

- 08.15** Excursion: site visit to Changi reclamation project.  
Assemble at Hyatt Hotel lobby.
- 12.30** Return from Changi visit.

## **Seatec 77** **DÉLEGATES INFORMATION AND PAPERS PROGRAM**





**TUESDAY, MARCH 1**

- 09.30** Seminar registrations desk open.  
Crystal Ballroom, Hyatt Hotel, floor 2.
- 11.00** Inauguration ceremony: Senior Minister of State –  
Communications The Hon. Ong Teng Cheong.
- 11.30** Exhibition tour by the Senior Minister
- 13.00** Buffet reception, Crystal Ballroom
- 18.00** Exhibition closes

**WEDNESDAY, MARCH 2.**

- 09.00** Seminar – Keynote Address.
- 09.15** Address of session chairman, Prof. Ir. P. Th. Velzeboer
- 09.30** "The demand for port facilities – determinants and responses"  
Mr. Eric Pollock.
- 09.50** "Roles of consulting engineer and of national government in  
planning and implementation of port development"  
Dr. Yuzo Akatsuka
- 10.10** "Construction of ports in developing countries: The consulting  
engineer's contribution – a subjective appraisal"  
Mr. P.G.R. Barlow
- 10.30** Coffee Break
- 10.50** "Economic appraisal of port projects and tariff structure for  
services and facilities – identification of revenue centres  
relatable to cost centres."  
Mr. V.R. Mehta.
- 11.10** "Contract specification and placement"  
Dr. S.K. Battacharya
- 11.30** "Sociological aspects of port development in developing countries"  
Mr. Kenneth Milburn
- 11.50** "Job creation and training in developing countries"  
Mr. Simon Feldman
- 12.15**  
**approx.** Lunch
- 14.00** Panel discussion: speakers will form a panel to discuss with  
delegates the subjects of the day's papers
- 16.30**  
**approx.** Chairman's closing summary

**THURS Y, MARCH 3**

- 09.00** Address of session chairman: Tuan Haji Mohd. Azuddin bin Haji  
Zainal Abidin
- 09.15** "Hydraulic research – expensive luxury or useful investment?"  
Mr. C. Veeningen
- 09.35** "Site investigations for port and harbour works"  
Mr. E. Loewy
- 09.55** "Directional methods of forecasting wind – generated sea waves"  
Dr. E. Serrano
- 10.15** "Dredging, a tool for port development – its use and misuse".  
Mr. F.C.H. Neervoort
- 10.35** Coffee Break
- 11.00** "Ecological and enviromental aspects of dredging and port construction  
construction"  
Mr. N.J. Ferguson
- 11.20** "The ecological impact of dredging operations"  
Dr. C. Rees
- 11.40** "Application of dredging technique for enviromental protection"  
Mr. E. Sato
- 12.00** "Operational aspects of dredging fleets"  
Dr. J.G.Th. Linssen
- 12.30** Lunch
- 14.00** Panel discussion
- 16.00**  
**approx.** Chairman's closing summary





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**Seatec 77**

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# Seatec 77

March 1 (TRADE ONLY) 11.30 — 18.00  
 March 2, 3, 4 (TRADE ONLY) 12.00 — 19.00  
 March 5 (TRADE and PUBLIC) 11.00 — 15.30

## Seminar & Exhibition

March 1-5  
 Hyatt Hotel, Singapore

## DIRECTORY OF EXHIBITORS

Sponsored by •UNESCAP, United Nations Economic & Social Commission for Asia and the Pacific

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Urban Projects

Van Oord-Utrecht N.V.

Oy Vesi Pekka

Wallace, Evans & Partners

Westham (Overseas) Dredging Pty Ltd

Wilson Walton International

Wilson Walton International

World ORT Union - Geneva

Zanen Verstoep N.V.

Zanen Verstoep N.V.

Port Authority of Thailand - Sub. Lt. Payung Bunyasiri R.T.N.

Malaysia Drainage & Irrigation Dept - Three delegates

## NAME

Mr Arthur Yeo

Mr Brian Chang

Mr A. Nass

Mr Yeu Bin Hu

Mr J. Ringers

Mr Nordin Abdul

Rahman

Mr G. Smith

Mr K. Hughes

Mr R. Bayless

Mr R.J. Osborne

Mr A. Teitrem Now

Mr D. Lavois

Dr E. Serrano

Mr A.M. Losada

Mr M. Chambers

Mr D.F. Roe

Mr L. Summers

Mr N.A. Trenter

Mr V. Scott

Mr C.A. Murray

Mr A.S. Furness

Mr T. Le'M Spring

Smythe

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Mr J. Wakelin

Mr N.J. Ferguson

Mr Koerveringe

Mr Gans

Mr Benning

Mr Verhulst

Mr Rajendram

Mr Ferwera

Prof. Ir. T. Ph Velzeboer

Mr E. Sato

Mr W. Service

Mr K. Milburn

Mr J. Sisselaar

Dr. Sabah Al-Nassiri

Prof. A. Walters

Mr J. van Blitterswijk

Mr P. Leppanen

Mr C.J. Evans

Mr M. Hendrikse

Mr T. Howse

Mr A.R. Coulman

Mr S. Feldman

Mr Tj. Visser

Mr J.V. Van del Wal

## COUNTRY

Singapore

Singapore

Singapore

Malaysia

Netherlands

Malaysia

Singapore

Singapore

Singapore

Hong Kong

Norway

Canada

Spain

Spain

U.K.

Singapore

U.K.

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Singapore

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Singapore

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Netherlands

Netherlands

Netherlands

Australia

Australia

Australia

Netherlands

Japan

Australia

Philippines

Thailand

Iran

U.S.A.

Netherlands

Finland

U.K.

Singapore

Singapore

Singapore

Switzerland

Netherlands

Netherlands

Thailand

Malaysia

# Seatec 77

## LIST OF DELEGATES



as at February 25, 1977



COMPANY	NAME	COUNTRY	COMPAN.	NAME	COUNRTY
Associated Builders & Contractors Sdn Bhd	Mr. L.J. Dalton	Malaysia	International Association of Dredging	Dr J.G. Th. Linssen	Netherlands
Atkins Research & Development	Mr C. Rees	U.K.	Companies	Mr M. Saurajen	Malaysia
Ballast Nedam Group	Ir. J. de Koning	Netherlands	Johore Port Authority	Mr Chong Chee Nam	Malaysia
Bay of Plenty Harbour Board	Mr E.R. Neighbours	New Zealand	Kelang Port Authority	Mr J.P. Robinson	Singapore
Belawan Port Administration	Mr. Sumardi	Indonesia	Kelvin Hughes (Singapore)	Mr D.S.S. Chin	Singapore
Bos Kalfs Westminster Group	Mr D.W. Querido	Netherlands	Keppel Shipyard Ltd	Mr T. Morozumi	Japan
British Transport Docks Board	Mr E. Pollock	U.K.	Kobe Steel	Mr Fung Chee Ping	Malaysia
Bureau Veritas	Mr J.W. Van Dijk	Singapore	Kuching Port Authority	Mr Ong Mee Lai	Malaysia
Calcutta Ports Trust	Dr. S.K. Battacharya	India	Kuching Port Authority	Mr K. Mahtani	Singapore
Canadian Government-Transportation Industries	Mr S. Skorupinski	Canada	K. Mahtani-Project Management Consultants	Mr A. Roberts	Singapore
Chancheewan Maunsell & Partners	Mr R. Thomas	Hong Kong	McDermott S.E.A. (Pte) Ltd	Mr S. Somabha	Vietnam
Comex Far East Pte Ltd	Mr D. Palmer	Singapore	Mekong Secretariat	Ir. S.E.M. de Bree	Netherlands
R.V. Conservator	Mr Holtappel	Netherlands	Mineral Technological Institute	Mr V.R. Mehta	India
Conservator (U.K.) Ltd	Mr L.M. Henderson	Netherlands	Ministry of Shipping & Transport - India	Mr T. Suzuki	Japan
Coude & Partners	Mr M.G. Briggs	Malaysia	Mitsubishi Heavy Industries	Mr T. Sumida	Japan
Coude & Partners	Mr P.G.R. Barlow	U.K.	Mitsubishi Heavy Industries	Mr Ongola	Kenya
Darti Indonesia	Mr H. Takayama	Indonesia	Mombasa Port Authority	Mr Karanja	Kenya
Darti Kijyo Co Ltd	Mr W. Abe	Japan	Mombasa Port Authority	Mr W. Boogerman	Singapore
Dragon & Trysall	Mr P.C. McKerrow	Singapore	Netherlands Maritime Institue	Dr H.J. Molenaar	Netherlands
Dart Hydraulic Laboratory	Mr C. Veeningen	Netherlands	Netherlands Maritime Institue	Mr A.O. Erinoso	Nigeria
Dart Hydraulic Laboratory	Mr H.J. Overbeek	Netherlands	Nigerian Ports Authority	Mr C.H.F. Neervoort	Netherlands
Dart Hydraulic Laboratory	Ir. J.G.H.R. Diephuis	Netherlands	Nigerian Ports Authority	Mr C.H.F. Neervoort	Netherlands
The Dart Dredge Corporation	Mr J.T. Dunn	U.S.A.	NIRWA		
The Dixie Dredge Corporation	Mr J.V. Bishop	U.S.A.	The Overseas Coastal Area Development	Dr Y. Akatsuka	Japan
Dredging V02	Mr A.F. De Bruine	Netherlands	Institute of Japan	Mr C. Goethals	Singapore
Dunlop Ltd	Mr D. Wyse	U.K.	Overseas Decloedt/Dredging International	Mr V. Smets	Singapore
Dunlop Ltd	Mr D. J. Stanley	U.K.	Overseas Decloedt/Dredging International	Mr J. Cummings	New Guinea
Engineers India Ltd	Mr V. Tapasvi	India	Papua New Guinea Harbour Board	Mr I.N. Mirchandani	
S.A. Enterprises	Mr J.P. de Nul	Belgium	Parsons, Brown & Newton	Tuan Haji Muhammed	
S.A. Enterprises	Mr A.C. Roekaerts	Belgium	Penang Port Commission	Azuddin bin Haji	
Far East-Livingston Shipbuilding Ltd	Mr Lim Peng Heng	Singapore		Zainal Abidin	West Malaysia
Far East-Livingston Shipbuilding Ltd	Mr Ong Tian Khiam	Singapore		Mr Loke Soon Chuan	West Malaysia
G.E.M. Hersent	Mr M. Labbe	France	Penang Port Commission	Mr Tan Sri Abdul	
Halcrow Middle East Ltd	Mr R.K. Hayward	Dubai		Jamil	West Malaysia
Halcrow Middle East Ltd	Mr J.G. Moon	Dubai		Mr J. Takoshina	Singapore
Halcrow Middle East Ltd	Mr D.J. Palmer	Dubai	Penta/Toa/Rinkai Joint Venture	Mr O. Nakagome	Singapore
Hollandsche Aanneming Mij B.V.	Ir. G.J. de Wolf	Netherlands	Penta/Toa/Rinkai Joint Venture	Mr Ang Soo Jin	Singapore
Hussein & K.H. Chong Sdn Bhd	Mr Hussein Bin Haji		Plantagen AG.	Mr P. Risch	Singapore
	Mohamed	Malaysia	Plantagen AG.	Mr J. Tiranda	Indonesia
I.C.I. Fibres	Mr P.R. Rankilor	U.K.	Port Authority of Palembang Indonesia	Mr R. Bolin	Sweden
I.C.I. Fibres	Mr G. Wu	U.K.	Port of Lulea, Sweden	Mr R. Tunhage	Sweden
I.C.I. Fibres	Mr Lee Soo Chong	U.K.	Port of Lulea, Sweden	Mr S. Karlsson	Sweden
I.C.I. Fibres	Mr R. Rust	U.K.	Port of Lulea, Sweden	Mr A. Vijaratnam	Singapore
I.H.C. Group	Mr B. Schuil	Netherlands	Port of Singapore Authority	Mr P. Chia	Singapore
I.H.C. Group	Mr C. de groot	Singapore	Port of Singapore Authority	Mr P. Ng	Singapore
I.H.C. Group	Mr J.J.C.M. Van		Port of Singapore Authority	Mr Tan Peng Kong	Singapore
	Dooremalen	Netherlands	Port of Singapore Authority	Mr A.S. Rangendra	Singapore
I.H.I Singapore	Mr Waserda	Singapore	Port of Singapore Authority	Mr Chia Hon Yoon	Singapore
Impressa Feroldi	Mr G.L. Conti	Italy	Port of Singapore Authority		



Wijsmuller  
P.O. Box 510,  
Ymuiden,  
Holland.

Tel: 2550-19010 Telex: 41110

Mng. Dir: J. G. Wijsmuller  
Com. Mgr: C. B. v.d. Zwan Tech. Mgr: A. van Lambaart

Wijsmuller owns and operates nine ocean going tugs (14000 ihp - 4200 ihp), one multi-purpose offshore, maintenance and salvage vessel and two heavy lift vessels called *Ocean Servant I* and *Ocean Servant II*.

One of the loading/unloading methods available is the float-on/float-off principle in which cargo with a maximum draft of 4.57 metres can be picked up by submerging the heavy-lift vessel regardless of the prevailing water depth while its deck remains parallel to the surface. The vessels offer a solution for clients needing cargo deliveries to remote areas where there are few loading facilities or congested port conditions.

Zeni Lite Buoy Co. Ltd.  
2-176-1, Teshina Minami,  
Ikeda City,  
Osaka,  
Japan.

Tel: 0727-627001. Telex: 5322235 Zeniya J.

President: I. Takeyasu  
Com. Mgr: M. Nakao Tech. Mgr: S. Kashiwaya

Associated company: Zeni Lite Buoy Co. Ltd., Singapore  
Branch Office, Singapore. Intraco Ltd. sole agent in Singapore.  
P. T. Kairaya Sari sole agent in Indonesia.

Agents for: Sumitomo Rubber Industries (sales); Automatic Power Inc. Corp, Houston (sales and service).

Manufacturer, supplier and consultant for all types of aids to navigation, including temporary buoys and beacons for marine construction works. Supplier of marine hardware, rubber fenders, chains, wire ropes, etc.

Stand No. A13

Stand No. B40

Canada

Stands No. B48/49

Department of Trade, Industry & Commerce, Ottawa, Canada.  
c/o Commercial Divn., Canadian High Commission, Faber House, 230/236 Orchard Road, Singapore 9.

Information by 25 Canadian companies on port handling, construction, engineering and dredging products and services.

**Atlantic Canada Consulting Group** (Engineering consultants)  
1313 Duke Street Tower, 5251 Duke Street, Halifax, Nova Scotia, B3J 1P3.

**Allis Chalmers Ltd.** (Materials handling)  
155 Danson Road, Guelph, Ontario, N1H 1A4.

**Barber Industries Ltd.** (Oil/Gas equipment)  
P.O. Box 5280, Station A, Calgary, Alberta.

**Bennett Pollution Controls Ltd.** (Pollution control systems)  
119 Charles Street, N. Vancouver, B.C. V7H 1S1.

**Birmingham Mer. Met. Corporation Ltd.** (Construction)  
Wellington Street Marine Terminal, Hamilton, Ontario L8L 4Z9.

**Canron Ltd.** (Materials handling)  
Mechanical Division, 100 Disco Road, Rexdale, Ontario.

**Carr & Donald & Associates Ltd.**, (Engineering consultants)  
55 Yonge Street, Suite 305, Toronto, Ontario.

**Clark Equipment of Canada Ltd.** (Materials handling)  
544 Talbot Street, St. Thomas, Ontario N5P 1C4.

**Farinon Electric of Canada Ltd.** (Telecommunications equipment)  
657 Orly Avenue, Dorval, Quebec H9P 1G1.

**Fenco Consultants Ltd.** (Engineering consultants)  
1 Yonge Street, Toronto, Ontario.

**Heede International Ltd.** (Materials handling)  
3140 St. John's Street, Port Moody, B.C. V3H 2C7.

**Howe International** (Engineering consultants)  
4333 St. Catherine's Street West, Montreal, Quebec H3Z 1P9.

**Huntec (70) Ltd.** (Marine surveys)  
75 Howden Road, Scarborough, Ontario, M1R 5A6.

**International Hydrodynamics Co. Ltd.** (Hycos) (Submersibles)  
P.O. Box 1059, Station A, Vancouver, B.C. V6C 2P1.

**John T. Hepburn Ltd.** (Shipboard materials handling)  
924 Dupont Street, Toronto, Ontario M6H 1Z2.

**McElhanney Offshore Surveying** (Marine Surveys)  
2601 Murray Street, Port Moody, B.C.

**Nautical Electronic Labs. Ltd.** (Navigational aids)  
Hacketts Cove, Halifax County, N.S.

**Per Hall Associates** (Engineering consultant)  
29 Gervais Drive, Suite 309, Don Mills, Ontario, M3C 1Y9.

**Quebec Engineering** (Engineering/construction)  
750 Laurentien Boulevard, Ville St. Laurent, Quebec.

**Sceptre Dredging Ltd.** (Dredging)  
1443 River Road, Richmond, B.C.



Wijismuller  
P.O. Box 510,  
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President: I. Takeyasu  
Com. Mgr: M. Nakao Tech. Mgr: S. Kashiwaya

Associated company: Zeni Lite Buoy Co. Ltd., Singapore  
Branch Office, Singapore. Intraco Ltd. sole agent in Singapore.  
P. T. Kaliraya Sari sole agent in Indonesia.

Agents for: Sumitomo Rubber Industries (sales); Automatic Power Inc. Corp, Houston (sales and service).

Manufacturer, supplier and consultant for all types of aids to navigation, including temporary buoys and beacons for marine construction works. Supplier of marine hardware, rubber fenders, chains, wire ropes, etc.

#### Stand No. A13

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Department of Trade, Industry & Commerce, Ottawa, Canada.  
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119 Charles Street, N. Vancouver, B.C. V7H 1S1.

**Bermingham Mer. Met. Corporation Ltd.** (Construction)  
Wellington Street Marine Terminal, Hamilton, Ontario L8L 4Z9.

**Canron Ltd.** (Materials handling)  
Mechanical Division, 100 Disco Road, Rexdale, Ontario.

**Carr & Donald & Associates Ltd.**, (Engineering consultants)  
55 Yonge Street, Suite 305, Toronto, Ontario.

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29 Gervais Drive, Suite 309, Don Mills, Ontario, M3C 1Y9.

**Quebec Engineering** (Engineering/construction)  
750 Laurentien Boulevard, Ville St. Laurent, Quebec.

**Sceptre Dredging Ltd.** (Dredging)  
1443 River Road, Richmond, B.C.



**Tractors Singapore Limited**  
26 Benoi Sector (off Pioneer Road),  
Jurong P.O. Box 170,  
Jurong,  
Singapore 22.

Tel: 261 2222 Telex: RS 21291

Mng. Dir: D. Park Dir/Gen. Mgr: T. Kanagarajah  
Director/Technical & Engineering Div: Han Swan Kie

Tractors Singapore Limited is the sole representative for Ellicott Machine Corporation International for Singapore, Malaysia and Brunei. Ellicott Machine Corporation manufactures cutter suction dredges that are widely used and known throughout the world.

The company is a subsidiary of Tractors Malaysia Berhad and is one of the 20 branches strategically located throughout Singapore, Malaysia and Brunei. The head office is situated in Petaling Jaya, Kuala Lumpur, Malaysia.

We are agents for the following: Caterpillar Tractor Company, earthmoving equipment and engines; Athey Products Corporation, tracked and rubber tyred earthmoving trailers, hi-loaders; Balderson Inc., specialised bulldozers and buckets; A. Friedr. Flender & Co., reduction gears, right angle drivers, flexible couplings; Hyster Co., logging equipment and winches; Pacific Car & Foundry Co., cargo winches; Rome Plow Co., heavy duty ploughs, harrows, landclearing K.G. blades, slopers; Sakai Heavy Industries Limited, road construction machinery.

**United Dredging Management**  
15th Floor, UIC Building,  
5 Shenton Way,  
Singapore 1.

Tel: 220 3752/220 8844 Telex: 23135 Echo

Com. Dir: Peter Fong Tech. Dir: Jeremy Caddy

Associated companies in: Jakarta, Indonesia; Manila, Philippines; Sydney, Australia; Bangkok, Thailand; Hong Kong; Dacca, Bangladesh.

Our basic strength is over 200 engineering years in engineering and construction. Our forte, providing management and operational back-up. Three divisions undertake:

**Dredging fabrication —**  
Dredge designers and builders. Fabrication of dredge modules. Dredge maintenance and service. Dredging and marine constructing. Leasing of dredges and auxiliary equipment. Harbour works. Land reclamation. Drainage and irrigation.

**Civil marine engineering —**  
Port development and design. Offshore terminals. Port handling facilities. Environmental and pollution control.

**Stand No. A18B**

**DredgeMasters International**  
Hendersonville, Tennessee, USA  
Represented by DredgeMasters International (S) Pte. Ltd.  
301 Cathay Building,  
Mount Sophia,  
Singapore, 9.

Tel: 235-3775 Telex: RS 22124 FSSI Cable: DREDGEMAST

Mng. Dir: Capt. M. J. Heasman

DredgeMasters International was established expressly for the purpose of designing, engineering and manufacturing standard model portable cutter suction dredges and equipment, and last year moved into the first plant ever built exclusively for the manufacture of this equipment. It is also the largest in the world. Apart from manufacture of complete dredges, our newly formed Systems Division has been created to provide the Dredge user with quality accessories and components. This innovative arm for the contractor combines dependability and economy with a service unsurpassed in the industry. In addition to DredgeMasters International in Tennessee, we maintain offices in Europe, Latin America and Asia, and also have manufacturing agreements with carefully selected companies and locations around the world.

**Dredging & Port Construction**

Intec Press Ltd.  
3, Station Parade,  
Whyteleafe, Surrey  
England  
Tel: (01) 688 1306 Telex: 27950

**Stand No. B24**  
MarIntec SEA (Pte) Ltd.  
J-6 International Bldg.  
Orchard Road, S'pore 9.  
Tel: 235 3900  
Telex: 23890

Publisher: Hugh Stanton Editor: Bill Reid

"Dredging & Port Construction" magazine are organisers of "Seatec 77". The February issue contains a world survey of port development projects, perfectly illustrating the use of the high-technology dredging industry as a tool for port construction. Also published are the regular features of dredging news, port developments, equipment and contracts, and personnel news.

For readers, the magazine is the only source of truly international news. For advertisers such as dredging contractors, contractors, dredger builders, survey and research organisations, and port builders, "Dredging & Port Construction" presents the most cost-effective method of reaching potential customers.



Ekman & Co. Pte. Ltd.  
1705-1709, 17th Floor,  
UIC Building,  
Shenton Way,  
Singapore 1.

Stand No. B36

Tel: 221-6644 Telex: RS 21675

Mng. Dir: Leif Sjöholm Com. Mgr: Johnnie Wong

Associate companies in: Austria, Holland, France, Germany,  
Ireland, Italy, Switzerland, UK, Hong Kong, Japan, Malaysia,  
Philippines, Thailand, Australia, South Africa.

Agents for the following companies: Linden-Alimak Cranes &  
Hoists, Salen-Wicander LUF, Demag Cranes, Freydenbo Steering  
Gears, Brunvle Bowthrusters, Schwing Concrete Pumps.

Ekman Singapore is a World Organisation of Swedish origin.  
With its H.Q. in Gothenburg, Sweden, it carries out marketing  
of various industrial and domestic commodities. Ekman Singa-  
pore handles products for the construction, marine, printing,  
packaging and food processing, consumer and other related  
industries. It gives the necessary after sales and service.

Hydraudyne B.V. — Hydrocare B.V.  
70 Van Salmstraat,  
P.O. Box 32,  
Boxtel,  
Holland.

Stand No. A12

Tel: 04116-4951. Telex: 50308 hydyn n.l.

Mng. Dir: Dick Huijgen Com. Mgr: Jan Zwanenberg  
Tech. Mgr: Frans D. Stuijvenberg

Engineering and production of oil hydraulics, linear and rotary  
drive and compensation systems for mercantile, dredging and  
off-shore industries. Standard and custom-built hydraulic  
cylinders. Service and repair assistance, pipe fitting and super-  
vision of all types of hydraulic installations, all over the world.

Smit International  
Westplein 5,  
Rotterdam,  
The Netherlands.

Stand No. A17

Tel: 010-362700 Telex: 22247

Singapore: Smit International South East Asia (Pte.) Ltd.,  
International Plaza, 20th floor, Room 2014, Singapore.  
Tel: 2207511 Telex: 23456

The Smit Company started its activities in 1842. With one  
paddle tug it assisted sailing vessels from the North Sea to  
Rotterdam and back. From this modest beginning it has  
developed into an Organisation which we now call the Smit  
International Group. Through the years towage and salvage  
were the mainstays of the Company's activities. However, in  
associated fields such as wreck-removal, heavy lift operations,  
supply services, marine engineering, tug/pontoon transporta-  
tion, ship-delivery etc., the activities became ever more  
numerous and varied. Today the Smit International Group  
can offer a wide variety of non-conventional marine services  
all over the world.

Stevin Groep NV  
Kaap Hoorndreef 66,  
Utrecht,  
The Netherlands.

Stand No. A14

Tel: 030 - 620880 Telex: 40649

Mng. Dir: K. van Exter

Australian Dredging & General Works Pty. Ltd.  
Head Office: 409 St. Kilda Road, Melbourne.  
Mng. Dir: H. Ferwerda

Associated companies in: Australia, New Zealand, Indonesia,  
Malaysia, Singapore.

Stevin Group is an international construction company based  
in The Netherlands, with 14,000 employees and a turnover of  
\$650m in 1976. The company specialises in engineering and  
construction of harbours and marine works including jetties,  
quays, piers and breakwaters, platforms, deepwater pipelines,  
road works, airports, buildings and housing. Construction  
activities are currently underway in over 25 countries all over  
the world.



**Santa Fe Engineering & Construction Co.**

**Stand No: A-1**

505 So. Main St. - P.O. Box 1401  
Orange California 92668 USA.

Tel: 377944 Telex: RS21340

Mng. Dir: G. Smith - Mgr. Pacific Area (F.E. Reynolds - President)

Com. Mgr: R. Olsen - Bus. Mgr. Singapore  
(M. Stamos - Controller)

Tech. Mgr: B.J. Warren - President  
Santa Fe Engineering Services

Associated Companies in: Indonesia, Singapore, Saudi Arabia, Iran, Bahrain, Egypt, U.K., Netherlands and others.

Santa Fe Engineering & Construction Co., a subsidiary of Santa Fe International Corporation, specializes in the design and construction of port and harbor facilities, onshore and offshore pipelines, oil and gas production facilities and other petroleum-related projects around the world.

In 1976 Santa Fe International had operations in the United States and 25 foreign countries.

**Schottel Far East (Pte) Ltd.**

**Stand No. B21**

Rm 804,  
Malayan Credit House,  
96, Somerset Road,  
Singapore-9.

Tel: 2355588 Telex: SCHOTFE RS 24715

Mng. Dir: A. P. Koomen Tech. Sales Mgr: M. Buijs

Head Office: Schottel Werft, Spay/Rhein, West Germany.  
Schottel-Nederland B.V., The Hague, Holland.

Manufacturers of Schottel propulsion equipment for dredging barges and all other floating equipment, horsepower ranging from 25 HP - 3500 HP.

(Schottel Far East is the official representative for the whole South East Asia area, with own service facilities)

**IADC (Intl. Assn. of Dredging Companies)**

**Stand No. A3**

Duinweg 21,  
The Hague,  
Holland.

Tel: 54 56 02 Telex: 31102 (Union)

Mng. Dir: T. G. Th. Linssen Tech. Mgr: Ir. Oosterbaan

International Association of Dredging Companies (IADC). Publishers of *Terra et Aqua*, international journal on public works and port development. Free copies available for professionally interested recipients. Back issues upon request. Joint publishers with BHRA, Cranfield, Great Britain, of *International Dredging Abstracts*. US\$66.00 a year via surface mail. Leaflet *IADC-in short* lists other activities and publications. See our Public Relations Officer and Editor Mr. N. Oosterbaan at our stand (A3) where copies of our publications, and those of BHRA which may interest you, can be inspected. News on forthcoming conferences available.

**ICI (Singapore) Private Ltd.**

**Stand No. B25**

Finlayson House,  
PO Box 284,  
Raffles Quay,  
Singapore 1.

Tel: 93811 Telex: RS 21111

Contact: Mr. George Wu

Associate Company: ICI (Malaysia) Sdn. Berhad, Wisma Damansara, PO Box 284, Kuala Lumpur, 23-03 Malaysia.  
Tel: Kuala Lumpur 743733 Telex: MA 30326

Contact: Lee Soo Chong

Terram is a polypropylene based inert fabric which is manufactured in various thicknesses by ICI for use in the construction industry.

The standard 140gm/sq m grade is widely used as a water permeable separator in road construction to inhibit loss of the road base into soft subgrade material, whilst the heavier 210 and 280 grades are used mainly as filter media in hydraulic structures.

In this latter use Terram has been used in Port construction works at Khorramshahr, Bandar Abbas and Bandar-e-Shahpur as well as in major foreign harbour construction.

Major savings have been made over the conventional, expensive aggregate filter materials, by the use of Terram.



**IHC Holland**  
2, Marconistr.,  
Rotterdam,  
The Netherlands.

Tel: (10) 765055 Telex: 23525 IHCC NL

President: D. L. H. Smit  
Member Board of Management (Commercial): B. Schuil  
Member Board of Management (Technical): D. Boterenbrood

Associate companies: IHC FEOS — Singapore  
IHC Holland USA — Mystic — Conn  
SBM Inc. — Monaco — Singapore —  
London — Houston — Rio de Janeiro

IHC Holland is an important supplier to the dredging world. As such they have built to date some 250 hopperdredgers, of which more than 100 are of the trailing type. No less than 526 cutter suction dredgers left their yards, 306 of them being custom-built and 220 standard demountable IHC Beavers.

IHC Holland also manufactures a series of amphibious standard dredgers for the mini-dredging market and a wide range of standard dredger components and dredging instruments.

IHC Holland has its own research and development centre. The services of this centre are available to all who require advice on dredging matters, including soil analysis. Other activities include engineering relating to dredging, alluvial mining, ore treatment and shipyard construction. The product programme of IHC Holland comprises also self elevating platforms for civil engineering, particularly where adverse conditions are encountered.

With today's giant tankers existing terminal facilities are proving inadequate for the quantities of cargo involved and the draft of the vessels employed, a solution to these problems are the offshore terminals such as SBM, SALM, SBS, SALS and SPAR designed, constructed and installed by SBM Inc.

**Stand No. A15**

**Royal Adriaan Volker Group bv**  
Oostmaaslaan 71,  
P.O. Box 2695,  
Rotterdam,  
The Netherlands.

Tel: (010) - 132140 Telex: 23486 mavo

Associate companies in Australia, New Zealand, Malaysia, Iran, Saudi Arabia, Abu Dhabi, South Africa, United Kingdom, Belgium, Italy, France.

The Royal Adriaan Volker Group is one of the foremost international concerns operating in the field of marine and general civil engineering.

A vast number of member and affiliated companies, both in The Netherlands and overseas, possess integrated contracting, research and development departments.

There are approximately 5100 employees in the Group. The following specialist activities are carried out: Dredging and land reclamation, port and waterway construction and maintenance; pipelines and cable laying; marine civil engineering; general civil engineering (incl. foundation techniques); (utility) building works; Project development (town planning and reconstruction); Offshore operations (development and construction of platforms).

#### **Group Companies**

Adriaan Volker Dredging  
Company, Rotterdam,  
The Netherlands.

Adriaan Volker Civil  
Engineering, Rotterdam,  
The Netherlands.

Visser & Smit, Pipelines  
division, Papendrecht,  
The Netherlands.

Aveco, Rotterdam,  
The Netherlands.

Australian Dredging & General  
Works, Melbourne,  
Australia.

#### **Management**

A. J. Hoekstra, M.Sc. (Eng)  
Delft, Managing Director

J. Smal, M.Sc. (Eng)  
Delft, Managing Director

H. D. Roozemonde,  
Assistant Managing Director

J. K. in 't Veld, M.Sc. (Eng)  
Delft, Managing Director

H. Ferwerda M.Sc. (Eng)  
and G. B. van der Vlies,  
Managing Directors  
M. A. Verhulst, Project  
Manager in Indonesia  
(stationed at Jakarta)

**Stands No. A4/A16**



**Robin Dredging (Pte.) Ltd.**  
35, Pioneer Road,  
Jurong,  
Singapore 22.  
or 23rd Floor,  
Robina House,  
1 Shenton Way,  
Singapore 1.

**Stand No. B23**

Tel: 656488 Telex: RS 24495 ROBINDREJ

Mng. Dir: Charles (Chase) R. McCoy

Associated companies in: Hong Kong, Jakarta, Houston, Dubai,  
Damman

Robin Dredging, a member of Robin Group, have 26 dredges of various types/sizes (cutter suctions, trailing suction, bucket and grab built by Robin Shipyard, another member of the group) capable of handling any material (silty sand, clay, shales, sandstone, rock and coral). Established in 1970, the company is experienced in dredging of swing basins, harbours, wharf mooring areas, deep water approaches for new ports, deepening and widening of shipping channels, etc., disposal of material for reclamation.

Robin Group also have diversified interests in port construction, civil engineering and sewerage works, shipbuilding and repairs, rig construction, drilling, oil tanker operations, trading, banking, building and realty, insurances, air travel, manufacturing of portable housing units, derrick construction, haulage services, etc.

**Ingeniør F. Selmer A/S**  
Postbox 256,  
Oslo,  
Norway.

**Stand No. B50**

Tel: (02) 20 83 30 Telex: 11246 Contr

Mng. Dir: L. Selmer Tech. Mgr: K. Jacobsen

Ingeniør F. Selmer A/S is the largest contracting company in Norway covering all fields of engineering works, leading in wet contracting with underwater blasting and dredging as specialities, and has the most extensive fleet of dredging equipment in the country.

Based on experience in harbour building over many years, Selmer has a department for design and construction of sea equipment such as barges, harbour tugs, dredgers, drilling rigs for underwater blasting, pontoons etc. For marketing and construction of this equipment, Ingeniør F. Selmer A/S has an agent, Viken Shipping Company (P.T.E.) Ltd. in Singapore. Through this company Selmer has delivered a large number of tugs and barges in South East Asia.

**International Dredging Gear Suppliers B.V.**

**Stand No. B**

Lindtsedijk 54,  
P.O. Box 169,  
Zwijndrecht,  
Holland.

Tel: 078-25300 Telex: 25039

Mng. Dirs: Mr. D. Moolhuizen, J. P. v.d. Grijp, W. v.d. Graaf  
Com. Mgr: Mr. A. A. Vos

I.D.G.S. located in Zwijndrecht, Holland, is a sales company owned by Van de Graaf B.V., Van de Grijp Buizen B.V. and Werf van Rees B.V. The company was finally floated after a period of years in which the three participants already intimately co-operated. The decision to float this sales company was made in order to be able to offer the large number of customers a complete range of dredging equipment. The large variety of dredging equipment that could thus be offered, moreover, favourably affected prices and delivery times, compared with the terms that could be offered by the various companies separately. Dredging equipment supplied by these companies has so far been sold to well-known contractors all over the world.

Fabrication of: Pipes in every diameter and execution; Floating pipelines; Steelplate ball-joints; Complete suction- and discharge piping; Valves for several purposes; Dragheads in several executions; Bends in various executions; Pontoons with pipe-supports; Flanges; Quick clamping devices; Swivel-bends; Ball-swivelbends; Installations for dredgers, including electrical equipment; Winches.



**Kobe Steel, Ltd.****Stand No B41 42**

No. 8-2, 1-chome, Marunouchi, Chiyoda-ku, Tokyo, Japan

Tel. (03) 218-7748 Telex: 0222-3601

President: Hideo Sugisawa

Overseas Offices: New York, Los Angeles, Rio de Janeiro, Dusseldorf, Singapore.

Based on the Iron and Steel Division, which produces 10,000,000 metric tons of crude steel annually, the Machinery Division produces plants, chemical machinery, industrial machinery, castings and forgings, construction machinery, and cutting tools; the Aluminum and Copper Division produces rolled and extruded products and copper tubes; and the Welding Division, welding electrodes and equipment.

**Company Outline:**

Established in 1905, Capital ¥101,284,820,000, Employees 35,000, Sales in 1975 ¥736,300,000,000, Export Sales in 1975 ¥174,100,000,000

**Marathon LeTourneau Offshore Pte. Ltd.****Stand No. B22**55 Gul Road,  
Singapore 22.

Tel: 652744 Telex: MARALET RS 21658

Mng. Dir: George H. Morris

Marathon LeTourneau Offshore Pte. Ltd. is a subsidiary of the Marathon Manufacturing Company of Houston, Texas, who is the world's foremost designer and manufacturer of mobile offshore drilling platforms. The Singapore yard as 33 acres and four launching sites, over 700 skilled and highly competent employees, crane capability of 240 tons, and a plate bender that can bend up to 4" plates. The yard has the latest in automatic welding and cutting equipment, including a positive quality control program and an engineering department with links to a top U.S. marine engineering company.

With our experience of 13 rigs, Marathon Singapore is ready to produce platforms, barges, bridge trusses, mooring buoys, pier islands, dredges, and other related marine products.

**Promet Group****Stand No. B45/B46**27 Pioneer Road,  
Singapore 22.

Tel: 650477 Telex: RS 21801

Mng. Dir: Brian Chang

Com. Mgr: R. Sherwood Tech. Mgr: Tan Teck Semg

Promet Group of companies: Construction of offshore vessels, tugs, barges and other self propelled crafts. Designers and fabricator of portable camps and accommodation modules. Design and manufacture of all types of winches, windlass, capstans and fairleads. General and precision machine work. Marine engineering and contractors. Drilling and production platforms. Oil and gas production facilities for onshore and offshore. Worldwide chartering and towage equipment. Manufacturing of steel castings for marine and general industry. Steel fabrication. Agents for Carboline marine paints.

**Robert Allan Ltd.****Stand No. A11B****Seatrans Pte. Ltd.**1008, 10th Floor,  
Orchard Towers,  
400 Orchard Road,  
Singapore 9.

Tel: 371688 Telex: RS 23890 NAVTRAN

Mng. Dir: Robert Allan

Com. Mgr: Ian Carne Tech. Mgr: H. Muhler

Naval architects and marine engineers. Specialists in unusual designs and problems. With associates Seatrans Singapore able to provide turnkey construction including design, construction and delivery at fixed prices of marine equipments.

We have affiliated or associate companies in the following locations: Singapore, Vancouver, India.



**OY Vesi-Pekka**  
Mikonkatu 11D,  
00100 Helsinki 10,  
Finland.

**Stand No. B35**

Tel: 13733 Telex: 122379 vespe sf

Mng. Dir: Paavo Leppänen  
Com. Mgr: Jaakko Forsberg Tech. Mgr: Teuvo Ali-Tolppa

Varied construction activities during 25 years; building of ports, quays, wharfs, docks; dredging of harbour basins, deepening of old channels and excavation of new. A new dredge design to meet the tough demands of contracts. This all first in Finland, then in all Scandinavia. Recently, a harbour expansion contract was awarded in Libya, and also another contract for building of a quay.

**Plantagen AG**

**Stand No. A18**

Jln. Dr. Kusumah Atmadja SH 58,  
Jakarta, Indonesia.

Tel: 43956/533778

Dir: A. Manik

Marine Sales Mnr: R. Harahap, Service Dir: A. Hoste

We are agents for the following companies and products for Sales and Service:

Rochem International, \*Alco Engine Div. (White), \*Maritime Industries Ltd., \*Wabco Fluid Power, \*Allen-Bradley Co., \*Schramm-Edi, \*Meco-U.S.A., Harnischfeger P & H, \*CE-Lummus Heat Transfer Div., \*Jaeco Pump Co., U.S.A., Armstrong Machine Works, \*Kobe, Inc., U.S.A., Marine Chemicals, Diesel Engines, Over-Stern Drives, (Bok) Thrusters, Thru-Hull Drives, Marine Air Controls, Electric Controls, Air Compressors, Gas Welding Equipment, Cranes, Heat Exchangers, Air Coolers, Condensors, Chemical Injection Pumps, Steam Traps, Liquid Drainers, Hydraulic Triplex Pumps, Roto-Jet, Hi-Pressure Pumps.

Associated companies in: Amsterdam, Singapore, Hong Kong, Medan, Padang, Palembang, Bandung, Semarang, Surabaya, Ujung Pandang.

\*Represented in Singapore and Malaysia by Holland-Asia Trading Co. Pte. Ltd. Room 212-220 Afro-Asia Building, 63 Robinson Road, Singapore 1. Cable: GEHASTED Telex: RS 21511 GEHAS. Tel: 73149 (5 lines)

**Mitsubishi Heavy Industries, Ltd.**

**Stand No. B43. 44**

5-1, Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan

Tel. (03) 212-3111 Telex: J22282

Mng. Dir: Isao Takezawa Com. Mgr: Hideo Tanaka  
Tech Mgr: Takei Baba

Mitsubishi consists of four headquarters and seven divisions with thirteen separate production facilities and three general technical institutes responsible for the development and manufacture of almost every conceivable product. Yearly sales exceed 1,080,000 million yen.

Outer space and oceanic explorations are obvious examples of fruitful exploitation of man's collective knowledge and combined capabilities; but one can as easily turn to challenging problems in such areas as information, education and housing.

MHI, backed by the Mitsubishi Group of Companies, and rich in technical and material resources, intends to embark on a developmental program that will set challenging new industrial standards.

Capital: ¥ 106,358,100,000. Employees: 82,040

**Mammoet Transport B.V.**

**Stand No. B37**

Westerdokdijk 40

Amsterdam/The Netherlands.

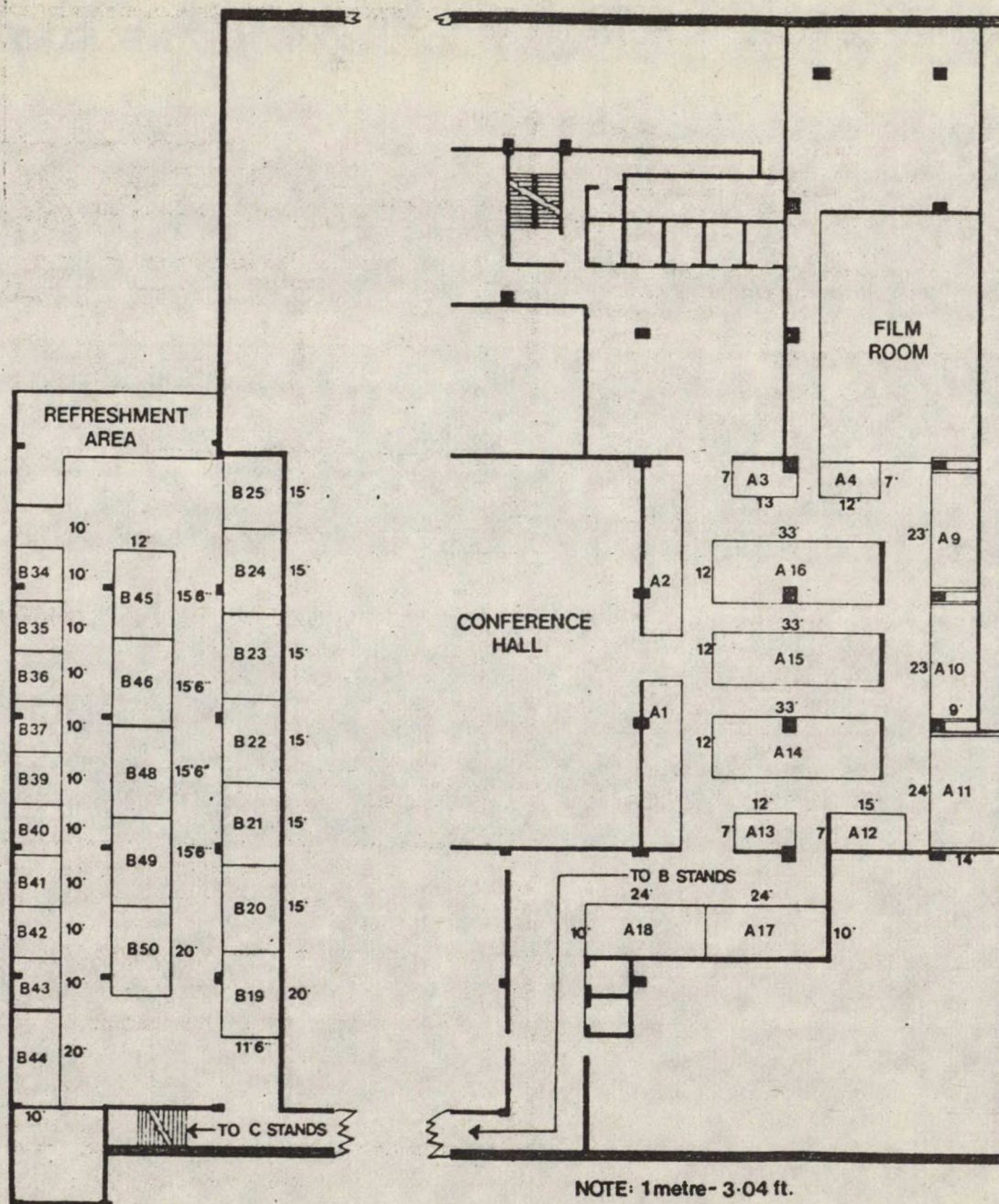
Tel. 020-221644 Telex 13681

MAMMOET in the service of port and dredging construction. Mammoet Transport is a heavy transport company operating worldwide heavy lift ships, floating derricks, tugs, barges, mobile cranes, platform trailers, and trucks.

One of the newest features is the seagoing submersible pontoons with a loading surface of approx 3,000 m<sup>2</sup> and a loading capacity of 11,000 tonnes (metric). They are designed by our engineering department for transporting objects such as dredgers and dredging material, drilling platforms, jackets, pilings, barges and modules.

With subsidiaries in The Netherlands, W. Germany, Belgium, Great Britain Spain, The Middle East and South America Mammoet Transport offers an integrated transport system.





NOTE: 1 metre - 3.04 ft.

# List of Exhibitors

Exhibitor	Stand
Canada	B48/49
Deacon & Trysail (Private) Limited	A10
The Dixie Dredge Corporation	A9
Dredge Masters International	A11
Dredging & Port Construction	B24
Ekman & Co. Pte. Ltd.	B36
Hydraudyne B.V. - Hydrocare B.V.	A12
IADC (Intl. Assn. of Dredging Companies)	A3
ICI (Singapore) Private Ltd.	B25
IHC Holland	A15
Ingeniør F. Selmer A/S	B50
International Dredging Gear Suppliers B.V.	B
Kobe Steel, Ltd.	B41, 42
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Mitsubishi Heavy Industries, Ltd	B43, 44
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OY Vesi-Pekka	B35
Plantagen AG	A18
Promet Group	B45/B46
Robert Allan Ltd.	A11B
Seatrans Pte. Ltd.	B23
Robin Dredging (Pte.) Ltd.	A4/A16
Royal Adriaan Volker Group bv	A-1
Santa Fe Engineering & Construction Co.	B21
Schottel Far East (Pte) Ltd.	A17
Smit International	A14
Stevin Groep NV	A18B
Tractors Singapore Limited	B19/B21
United Dredging Management	A18A
Van der Horst Asia Pte. Ltd.	B39
Walter Wright (S) Pte. Ltd.	A13
Wijsmuller	B40
Zeni Lite Buoy Co. Ltd.	

MALAYSIA - March 7 - 10, 1977

Meetings were held with:

Mr. E. G. Jones, Commercial Counsellor, Canadian High Commission  
Mr. G. H. Bates, Assistant Commercial Secretary, Canadian High Commission  
Mr. Ngau Boon Keat, Head of Engineering Dept., Processing and Manufacturing Division, Petrolam Nasional Berhad, PETRONAS  
Mr. K. Kunitoni, Manager, Marubeni Corporation  
Mr. Ron Steedman, Director, Shawinigan Engineering  
Mr. A. Ramanath, Deputy General Manager, The National Electricity Board (NEB)  
Mr. S. H. Simatu Pang, Deputy Director (Operations), SEATAC  
Mr. Pang Tin Fun, Deputy General Director, Civil Aviation Dept.  
Mr. Victor Davey, Director FIR and Advisor, Civil Aviation Dept.

GAS AND OIL

Mr. Ngau Boon Keat is a young and very knowledgeable man. Petronas is a 100% government-owned national gas and oil company, formed in 1974 and owning all the gas and oil resources of Malaysia. Production sharing have been signed with a number of multinationals, including Exxon and Shell, negotiations are proceeding with Connoco. The Shell and Exxon concessions were given out prior to the formation of Petronas and it is now their policy to reserve large blocks for their own exploration and production. Offers by the Japanese to carry out seismic work in these blocks, free of charge, has been turned down. The Malaysian offshore potential is very large indeed, comprising offshore east and west of the Peninsula and the already established areas, offshore Sarawak (Sarawak Shell) and Sabah (Sabah Shell). <sup>A</sup> An LNG plant is to be built at Bintulu, Sarawak for export of gas to Japan by 1982. This will be a massive development including a large new port (Monenco PEMD A06060) and other infrastructure developments. Equipment for the LNG plant will go to tender in 1978.



In addition to the multinationals, the Japanese are very active. C. Itoh are carrying out an aid-financed master plan for the utilization of petroleum resources which will be completed this year.

Mr. Ngau Boon Keat has visited Japan, France, the U.K. and Norway, and is going to the USA shortly. He showed considerable interest in Canada and how we could participate in their program. I suggested that he should carry on to Canada from his US trip. He replied he could never afford to be away for more than ten days at a time, but that he would be interested in arranging a Canadian visit comprising one or two people from each of the Exploration and Production Division, and the Processing and Manufacturing Divisions, for about ten days this year. They would be most interested in our expertise related to equipment and services downstream of the well head. Malaysia has been allocated a urea plant as an ASEAN industrial project to utilize Sarawak natural gas. Preliminary planning work could start this year for completion in 1982.

Once again, training is a major concern, they have people placed all over the world, but would like to get more people into petrochemical plants, refineries, etc. I told him about the drilling school in Edmonton and he was very interested. Petronas pays the full cost of all overseas training. Malaysian production of low sulphur oil now is 200,000 barrels/day, of which 100,000 b/day is exported to Japan, SEA countries and the USA. Production for 1980 is projected to be 500,000 b/day. Gas resources appear to be much larger than oil at the present time.

I strongly recommend that our overall liaison with Petronas be stepped up, and that an incoming mission be arranged as soon as practical.

#### POWER

- a. Discussions were held with Mr. K. Kunitoni, Manager, Marubeni Corp. about the recent bid for 2 x 120 MW boilers to the NEB for the Pasir Gudong station. Marubeni are the Combustion Engineering Canada agents and I had carried some of the bid documentation to SEA with me.

The bids had just been opened. Prices were as follows:



K.M. Stork (Holland)	52,705,500
Borsig	50,680,020
C. Itoh (IHI-CE)	49,578,784
C.E. (Canada)	61,310,100
De Schelde (Poland)	41,000,000
BHEL (India)	38,129,033 (low bid)
Wagner Biro (Austria)	63,998,120

The turbo generator bids were as follows:

C. Itoh (Fiji)	49,284,000 (low bid)
C.A. Parsons (UK)	71,685,000
G.E. (USA)	78,183,000
Brown Boveri (Germany)	68,000,000
Alsthom (France)	80,000,000

Although C.E. Canada are fairly competitive on the last round of similar boilers for the Nan Prai station, this time they were over 50% higher than the Indian bid for boilers of C.E. design. The Indians have already sold six 120 MW boilers to the NEB, three for Port Dixon and three for Nan Prai, and will almost certainly be awarded the Pasir Gudang contract, for which Tatra Engineering of India have been awarded the consulting contract in competition with Shawinigan, Monenco, and other international power consultants.

Although financing proposals had been invited, the C.E. bid did not contain anything other than a general statement. On the Prai bid, I was told the Indians are financing at  $7\frac{1}{2}\%$ , 10 years, no grace period.

Marubeni expect to bid with CE on the next major boiler requirement, 3 x 300 MW units for Port Klang in October 1978. The Indians do not build 300 MW units and it is hoped they will not bid.

- b. Discussions were held with Mr. Ron Steedman of Shawinigan Engineering. The Temengore project is going well, all four units will be operational by July 1978. The balance of the CIDA Temengore loan is being used by Shawinigan to develop two hydro sites downstream, Bersia (78 MW) and Kenering (120 MW). The feasibility studies are complete. A loan agreement

for \$7½ M of design and construction supervision work has been signed with CIDA and authorization to commence work is expected shortly. The projects are scheduled to be completed in 1981. Other potential hydro work includes an extension to the Chenderoh station and two small hydro stations for industrial plants. Shawinigan have studied the mini-hydro plant potential and judge the Barber turbines to be very applicable.

Shawinigan/Canada Lefrage have an agreement on cement plant design and construction and are bidding on a project in Malaysia. In most cases the owners are looking for an investment in a joint venture.

The Australian government-owned Snowy Mountain Authority have just got two aid-financed hydro consulting jobs in Malaysia. The Japanese are responsible for the 225 KV transmission line from Temengore.

Shawinigan will bid on the consulting engineering for Port Klang thermal station and will also be bidding the Prai/Penang Island overhead AC connection. This is a \$20 M project with about \$0.5 M consulting services, for which tenders close on March 15. Twenty-five consultants have been shortlisted, including Acres and Monenco.

- c. Discussions were also held with Mr. A. Ramanath of the NEB. I first met Mr. Ramanath on the incoming power mission and subsequently on my last visit to Malaysia. As usual he was friendly but extremely frank.

In addition to confirming the information given to me by Mr. Kunitoni and Mr. Steedman, Mr. Ramanath made the following points:

- Installed capacity of the NEB will double from 896 MW (1975) to 1,985 MW (1980).
- Commencement of work on Port Klang is about one year off, but he was preparing the call for tender for consulting services.
- C.E. should do some value analysis on their boiler design. For example, in many cases the finishes specified are too sophisticated and serve no useful purpose.
- The C.E. bid contained no specific financing offer. The NEB evaluate all bids on a present worth basis and would evaluate C.E. as if they had to pay cash. This automatically ruled them out. All other bidders

made specific financing offers.

- Japan is presently negotiating a \$1,000 M Malaysian (approximately \$400 M Canadian) line of credit with the Malaysians at 5-5½%, 20 years amortization, and seven years grace from time of signing. The loan is to be committed in seven years (1977 - 84), with 13 years repayment starting in 1984, i.e. if a contract is signed against this loan in 1977 it will have seven years grace, if signed in 1980, there will be only four years grace. This sounds like a neat way to ensure a line of credit is utilized and committed early.
- Japanese normal commercial credit terms are 7½%, 10 years, two years grace from commissioning.
- The NEB is still interested in the Canadu and would like Dr. Pon of AECL to visit them.
- India is working on a 350 MW Candu reactor, which may be more their size than the Canadian 600 MW.
- A number of hydro projects are planned for Sabah-Magor and Temon Pangli and Sarawak-Batang Ai and Batang Belaga.

#### CIVIL AVIATION

Discussions were held with Mr. Pang Ting Fun of the Civil Aviation Department. The expansion to Penang Airport is almost complete and is to be commissioned this month. The terminal, which is being built by a Korean company, is not yet completed.

The ILS system for which Philips Canada bid, is to be awarded in April. Mathews put in a strong bid for the baggage handling system, but the contract has been awarded to Marriot Handling of the UK.

The expansion work on Kuala Lumpur was suspended due to a contractual disagreement with the US consultant. It is now anticipated that work will resume in April and that tender documents will be issued in September 1977. Local financing will be used.



Raytheon was recently awarded a \$5.6 M radar contract. Two more radars may be ordered in two years time. Civil Aviation's Marconi ATC simulator is now working well after major modifications. However, Canadian aid through ASEAN may be used to extend ATC simulator facilities. Training is still very high on their priority list, but no funds are available.

Boeing have evaluated the runways of their domestic airstrips for utilization by 727 aircraft. Additional nav aids for this program will be required in 1979 and there is also a requirement for a more thorough runway evaluation program. Kuala Trengganu is one of the airports to be expanded with new terminal and nav aids. Consultants may be hired to help their own staff to develop an air cargo centre at Senai as part of the Jahor Airport expansion.

#### Sabah

Two regional airports are to be developed, one of which, Kotakinabalu, was recommended in the Acres/SWR 1972 study.

#### Sarawak

The existing airport at Bintulu cannot be expanded for use of 727 aircraft because of the local topography, and a new airport will have to be built to meet the requirements of the LNG plant and other developments in the region. Civil Aviation's budget was cut by 40% last year, so there is no money to proceed with this big project in 1977. Miri Airport will be expanded for 727's.

Mr. Pang Tin Fun showed me a preliminary report on the expansion of Kuching Airport prepared by Frederick Snow (UK) and a Malaysian architect. He recommended that Canadian airport consultants form a permanent association with a local company, since preference is given to joint ventures of this type.

#### SEATAC

Discussions were held with Mr. S. H. Simatupang, Deputy Director, the Southeast Asian Agency for Regional Transportation and Communication Development (SEATAC).

SEATAC was formed in 1972 and is based on an ADB-financed, A.D. Little transportation study of SEA. Supporters include the USA, Japan, Australia and New Zealand. Canada is the only Pacific nation not giving support. The staff comprises seconded transportation experts and economists from all over the world, including several European countries.

Assistance has been requested a number of times from Canada, since ASEAN has now set up a regional transportation group in Jakarta (which is supported by Canada), and co-operation between the two organizations is being worked out.

Anyone interested in this subject should contact me for further details.

\* \* \*



THAILAND - March 10 - 14, 1977

Meetings were held with:

Mr. John Lang, Commercial Secretary and Consul, Canadian Embassy  
Mr. A.E. Bourassa, Assistant Commercial Secretary, Canadian Embassy  
Khun Manus Veraburut, Senior Engineer, Mineral Resources Dept.,  
Ministry of Industry.  
Khun Prapha Buranadilok, Deputy Director, Harbour Dept.  
Khun Pisoot Sudasna, Director General, Mineral Resources Dept.,  
Ministry of Industry.  
Chana Nilkuha, Deputy Director General, Department of Mineral Resources.  
Group Cpt. Udom Thanomkulbutr, Deputy Director of Civil Aviation,  
Directorate of Civil Aviation, Royal Thai Air Force.  
Khun Verasakdi Dhanaphatana, Chief, Port Operations Dept., Port  
Authority of Thailand.  
Khun Pat Kessasamli, Chief Engineer, EGAT.

SALT AND SODA ASH PROJECT

Discussed with Khun Manus Veraburut, Khun Pisoot Sudasna and Chana Nilkuha,  
Mineral Resources Dept., Ministry of Industry, at separate meetings.

Background

Two Canadian organizations have been shortlisted by the Asian Development Bank/Ministry of Industry for the \$260,000 feasibility study for a \$150 M, 400,000 ton/year salt and soda ash project in eastern Thailand. This is an ASEAN supported project to supply soda ash for the manufacture of glass, ceramics, soap, and other chemical projects for all ASEAN members, and to export about one million tons/year of rock salt to Japan, Taiwan and S. Korea. Thailand has vast resources of natural salt which are presently not being utilized. The Canadian companies shortlisted are Acres/Sproule and SNC along with five others, including Flour and Stearns Rogers of the USA. I was briefed by a member of the former group prior to departure and requested to obtain specific



information and documents, all of which were made freely available to me by the Thais. The documents and information have been passed on to the company in time to be incorporated into their proposal for April 18 closing date. If implemented, the project will be financed under ASEAN regulations, 60% Thai and 40% from the four other Asian countries. The Thais have allocated \$1 M for local costs of the feasibility study and will be responsible for exploratory drilling to prove up the salt reserves, which we already know to be extensive.

The proposed schedule is as follows:

Award feasibility study	April 1977
Complete feasibility study	October 1977
Decision to implement or not	December 1977
Project completion	1981

The project, which is highly capital intensive, will comprise a mine, railway line, process plant on the coast, and port facilities. The economics of all aspects of the project, particularly transportation, are of critical importance since the natural soda ash resources of Kenya and other African countries are being further developed and set the international price level for soda ash.

Both Khun Manos Veraburut and Chana Nilkuha have been in Canada twice, visiting asbestos, potash and salt mining companies, including Cominco. These officials were most courteous and helpful, and I get the impression that one or other of the Canadian bidders has a better than average chance of being awarded the feasibility study. I was told that implementation could be in the form of a turnkey project with an operating contract. Thailand has a wide range of mineral deposits including asbestos and zinc, for which a major project is in the advanced planning stage.

One point which was made most forcibly to me by Khun Pisoot Sudasna, General Director of the Mineral Resources Dept., who is very familiar with Canada but has never been here, is his desire to have his people trained in Canada. He complained that they are having difficulty getting their people into Canadian universities because of entrance requirements, but even so they are prepared to send their people who have graduated from U.S. universities to Canada for post graduate work, or on the job training in mines and process

plants. At present, one of his people is attending a special course in mining economics at McGill. I was assured that the Thais are prepared to pay for all the training they get, and that the money is available.

#### GAS AND OIL

Discussed with Khun Pisoot Sudasna, Director General, Mineral Resources Dept., Ministry of Industry.

The Gulf of Thailand has high gas and oil potential and has already been fully leased by multinationals such as BP, Tenneco, Connoco, Gulf, Amoco and Triton. The Canadian companies, Superior and Home Oil, are also involved. There have been three oil and eight gas finds offshore to date and exploration work is proceeding. The Thais do not intend to set up a national oil company of the Pertamina or Petronas type, but rather to buy all their gas and oil from the multinationals. However, they have formed the Natural Gas Organization of Thailand, which will be the common carrier for all offshore gas to the mainland and be responsible for processing, distribution and marketing.

Sofregaz of France is carrying out a study of the utilization of the gas and has issued an interim report. The final report will be issued in May, 1977. The British Gas Council is making a study of pricing policy. First delivery of gas to Bangkok is scheduled for 1981. The main consumers will be EGAT (power utility), which is to build a new 2 x 500 MW gas/oil-fired thermal power station on the coast, and a large number of industrial organizations. It is not intended to distribute gas for residential use at this time, but rather to introduce it into new towns being planned outside Bangkok.

Unfortunately, I did not have time to visit the Natural Gas Organization, which is a separate profit-making entity. However, I suspect that significant opportunities for consulting, pipelining, process plant, etc. will be developing to implement their plans and the post agreed to investigate this whole sector in depth on our behalf.

Consideration should be given to inviting Thai officials connected with the gas and oil industry to visit Canada either individually or as part of a SEA group (see also Malaysia and Indonesia).



POWER

Discussions were held with Khun Pat Kessasamli, Chief Engineer, EGAT.

My first encounter with Khun Pat was during the incoming power mission from SEA in 1975. Later that year I met with him in Thailand. As pointed out in my report of November 1975, Canada has not done well in participating in the very substantial electrical generation and distribution program of EGAT in recent years, with the exception of Acres involvement in the now complete Sirikit hydro project, and the recent Babcock & Wilcox order for 2 x 75 MW, lignite-fired boilers for Mae Moh. These boilers are presently being erected. One of the major reasons for lack of involvement of Canadian consultants is the non-involvement of CIDA in financing feasibility studies. This was confirmed by an analysis of how the consultants responsible for major projects initially became involved in the work. Khun Pat, who is very pro-Canadian, friendly, and full of helpful advice, put it like this:

"Canadian companies should pay more attention to Thailand. If you want to catch a large fish, you have to use a little bait."

Mae Moh Project - Units 1 & 2

A lignite-fired thermal station. 2 x 75 MW, Babcock & Wilcox boilers are being installed with Japanese turbines and German generators. Some delivery problems with Babcock & Wilcox equipment. Boilers on critical path. Babcock & Wilcox representatives, including Mr. Bret Dainard, Export Sales Manager, visited the site during my stay. Additional large lignite resources have been proved up, and EGAT is considering units 3, 4, and 5 of 150 - 200 MW each for 1978/79 procurement. Babcock & Wilcox are pursuing a repeat order for these units. Units 1 and 2 were ADB-financed. The ADB is now demanding a rate increase for electricity before making further loans to EGAT. The Thai government has refused an increase at this time for political reasons, and resents the ADB's attitude.

Bhumibol - Thermal power station, no. 7 unit awarded to Hitachi/AEG.

Quae Noi - (2 x 145 MW) Hydroelectric Project. Snowy Mountain Authority doing feasibility study. Australian aid.

Lang Suan - (4 x 50 MW) Hydroelectric Project. German aid for feasibility study.

- NOTE: at the time of my last visit consulting services for the

above two projects were being sought through aid channels. CIDA was aware.

Pattani - (2 x 40 MW) Hydroelectric project. Consulting by Parker & Sverdrup. U.S. aid. Loan request made to IBRD for financing construction.

In the event that units 3, 4 and 5 are installed at Mae Moh, a 230 KV line will be installed. Electrowatt and Motor Columbus are the overall consultants for Mae Moh.

The Thai interest in nuclear power has been postponed with the discovery of commercial quantities of natural gas in the Gulf of Thailand. It is now planned to build a 2 x 500 MW, or 2 x 600 MW, gas/oil-fired thermal station on the coast. The U.S. consultant, Black & Vietch, is carrying out the feasibility study. This would appear to be a prime opportunity for Canadian boiler manufacturers, Babcock & Wilcox and CE, since we are most competitive in these large unit sizes.

The lack of involvement of Canadian consultants in the EGAT power program is regrettable, but can be directly attributed to our lack of interest in the past. Future involvement, assuming CIDA's lack of interest, must come through aggressive bidding and marketing on ADB- or IBRD-financed projects.

In general, EGAT has the competence to engineer their own transmission and distribution projects.

#### PORTS

Discussed with Khun Prapha Buranadilok, Deputy Director, Harbour Dept., and Khun Verasakdi Dhanaphatana, Chief, Port Operations Dept., Port Authority of Thailand at separate meetings. Both of these officers were on the incoming ports mission from SEA in October, 1976.

Two ADB-financed port projects are underway at Phuket on the west side and Songkhla on the east side of the peninsula, close to the Malaysian border. The feasibility study has been completed by Rendel and Partners, Australia, for development of the existing ports for deep water operation at costs of \$4 M for Phuket and \$20 M for Songkhla. Construction work will be carried out over the period 1977 - 1980, and equipment, mainly fork lift trucks and cranes, will be purchased in 1979. The consulting services for detailed design of these ports will be financed by the ADB from a \$1.5 M loan. Tenders have not yet been called. The project engineer is Pongsuk Wongsamut.



The development of the East Quay of Bangkok port under a \$12.5 M, IBRD loan is nearly completed and will meet the shallow water import requirements for several years. The consultant is NEDECO of Holland. A decision on the construction of a deep sea port on the east coast of the Gulf of Siam has still not been made but there appears to be a preference for the development of the Royal Thai Navy facility at Sattahip, rather than building a new port at Laem Chabang, because of the high infrastructure costs (estimated at \$60 M) associated with this site. Consideration is being given to the extension of the railway to Sattahip and some bulk commodities, transported by road, are already being exported through the port. A private company has developed a pier for the export of tapioca, which is capable of handling 60,000 ton ships.

Having established our capability with the incoming ports mission and generated a lot of good will, we should continue to monitor these developments closely.

#### URBAN TRANSPORTATION

Bangkok has one of the worst traffic problems of any major city in the world. The high water table precludes the construction of subways. During my visit, the interest of the Minister of Interior, Samak Sundaravej, in visiting Canada to investigate possible solutions was raised. The Infrastructure Division supported this visit and organized a suitable itinerary April 3 - 7, in co-operation with the Bureau and other interested Branches. The background to this visit and the outcome will be contained in a separate report. In summary, however, the visit was highly successful and a consortium of Canadian consultants, headed by the UTDC, was invited by the Minister to visit Bangkok in early May for initial investigations and negotiation.

#### CIVIL AVIATION

Very little information was available due to the fact that the U.S. consultant, Tippetts, Abbot, McCarthay, Stratton is carrying out a study of Don Muang Airport (Bangkok) to determine future expansion requirements. The most recent runway expansion is now complete. This report should be completed

in October 1977, and the post was invited to meet Captain Udom about this time to discuss its implications for Canada.

Some consideration is being given to moving the air freight cargo service from Don Muang to U-Tapao, and reserving Don Muang for passengers.

\* \* \*



INDONESIA - March 15 - 19, 1977

Meetings were held with:

Mr. C. A. Carruthers, Commercial Secretary, Canadian Embassy  
Mr. H. McNairnay, Assistant Commercial Secretary, Canadian Embassy  
Mr. P. M. Pichette, Third Secretary Commercial, Canadian Embassy  
Dr. L. E. Heuchroth, First Secretary, Development, CIDA  
Mr. A. M. Hurter, President, Stadler Hurter Ltd.  
Mr. S. Detre, Manager, Thermal Study Group, Montreal Engineering  
Mr. A. Sawchuck, Peter Bawden Drilling  
Mr. A. N. Alexeev, Vice President, Asamera Oil Indonesia  
Ir Sarjono, Director of Planning, PLN  
Mr. A. S. Sunandie, Planning Dept., Directorate General of Air  
Communications  
Air Marshal Herlambang, P.T. Indoplano  
Ir M. Pulungan, Dept. of Chemical Industries  
Mr. S. Takahashi, Deputy Director, IBRD  
Mr. Sugianto Wignjo, Port Administration, Directorate General of  
Sea Communications

GENERAL

Indonesia still presents the most fascinating, diversified, and non-committed market for Canadian consultants and equipment suppliers, in spite of recent economic problems. Canadian consultants have made a significant effort in the last few years to become recognized and established in Indonesia with some notable success, i.e. Swan Wooster, Monenco, Canadian Pacific Consultants, Aviation Planning Services, Stadler Hurter, etc. It appears to be taking longer to establish Canada as a major equipment supplier despite the activities of CIDA and the current EDC line of credit.

Indonesia is undoubtedly the most difficult country in SEA in which to market due to such factors as the wide dispersal of government departments, lack of effective telephone system and the extremely heavy work load of decision-making officials. These factors dictate the absolute necessity that no government or industry representative should meet with Indonesian officials unless they know exactly why they are there, what they want to know, and have studied all available sources of information on the subject before hand.

The long term potential of this market would appear to justify an in-depth marketing study, one aspect of which would be a schedule of recommended promotional activities to be carried out in the next three years.

#### CIDA PROGRAM

The CIDA program for Indonesia is being re-thought on a sector by sector basis. The budget is \$200 M over five years with disbursements of \$40 M in 1975, and \$30 M in 1976. Sectors of concentration are likely to be: water resources, agriculture, transportation, power, and regional development.

The power sector is new and a program is scheduled to be established in June. Two CIDA officers from Ottawa were due to arrive to assess power projects during the week that I was there. Expansion of existing hydro plants and the establishment of mini hydro plants is being considered, together with transmission and joint ventures with US AID to establish small, consumer-run, rural utilities similar to those set up in the Philippines by the U.S. Canada would likely supply the equipment (either hydro or diesel) and the U.S. the utility know how. This interesting concept should be followed closely by ITC since it could possibly be developed into commercial saleable package in other overseas markets.

Other CIDA projects include 39 steel bridges in Sulawesi, the supply of a fourth Canadian Westinghouse gas turbine generating set and \$4.3 M worth of aviation navigational aids from Raytheon.

CIDA has also been approached on the financing of 17 DH Dash-7 aircraft, but has referred the Indonesians to EDC.



## GAS AND OIL

Discussions with Mr. A. Sawchuck of Peter Bawden and Mr. A. N. Alexeiev of Asamera.

The recent revision by Pertamina of the leasing agreements with the multinationals has reduced profits to the point where exploration work has been neglected. This situation is now improving and there should be a substantial increase in exploration work in 18 months. Peter Bawden is only equipped to do onshore drilling in Indonesia and has a contract to develop the gas reserves for the Pusri fertilizer plant on Sumatra, on which two of their three rigs are active.

Indonesian production is about 1.6 M b/d of low sulphur crude which finds a ready international market. In spite of the fact that exploration work has virtually ceased, production keeps rising. This is due to the high production of one or two "fabulous" fields such as the Caltec (850,000 b/d), and Total (250,000 b/d) fields on Kalimantan.

Pertamina had decided to take over all onshore exploration and production drilling, but finds this impossible due to lack of money, and is now negotiating with potential partners.

Pertamina has a policy that if equipment is made in Indonesia, nobody can import an equivalent, and this includes the multinationals as well as themselves. Domestic production of items such as mud are being established to take advantage of this.

The Australians recently put on a solo gas and oil equipment show. Perhaps we should consider this type of promotional activity or a broadly based solo show of the type put on by France, March 26 - April 3, 1977, see attachment. The multinationals purchase most of their equipment through head office. Pertamina is the potential market in Indonesia and it is recommended that consideration be given to inviting a group of Pertamina officials to Canada in 1977/78.

The Quadra Engineering gas pipeline laying contract for Pusri, which was in the course of negotiation during my last visit to Indonesia, has been completed satisfactorily, on time and within budget. Unfortunately, Quadra lost the second phase of this work to the Japanese on price.

Westburn Industries of Calgary have a service contract with Pertamina which is managed from their office in Singapore.

#### POWER

Discussions with Ir Sarjono, Director of Planning, PLN, and Mr. Bret Daynard, Export Manager, Babcock and Wilcox Canada Ltd.

The install capacity of PLN is presently 1600 MW and will increase to 2200 MW by the end of the second 5 year plan (1979). Whilst a number of hydro developments are planned, they are mainly of small output and the major increment will be in oil-fired thermal stations, with the possible use of Sumatran coal in West Java. Financing is mainly through the IBRD or the ADB. The key man in the IBRD Washington is Mr. Dieter Manem.

PLN is presently working on the approved 1976/77 "Blue Book" program, the 1977/78 program has yet to be approved. Whilst PLN prepares the program, authorization to proceed is controlled by Bappinas which establishes the source of financing. In effect, Mr. Sarjono said you have the Blue Book, if you are interested in any of the projects, offer to finance them to Bappinas.

The present status of thermal power projects was reviewed and summarized (see attachment following page 30).

Mr. Sarjono expressed interest in the concept of micro hydro installations and consumer-managed utilities, and suggested we make a proposal to Bappinas (see CIDA Program).

The terms of reference are being prepared for the IBRD-financed Java interconnection project, and tenders are expected to be called later this year. Montreal Engineering and Shawinigan are pursuing this project.

Montreal Engineering are carrying out the feasibility study and site selection for the 750 MW Cilincing Thermal Power Station in W. Java under IBRD financing (PEMD A05016). Four alternative sites are being studied and the work has been expanded to include consideration of coal-firing utilizing coal from south Sumatra. Swan Wooster is involved in assessing the port requirements of the coal transport and Canadian Pacific Consulting Services are assessing the rail requirements.



In the future, mine head thermal plants may be built in Sumatra and the power transmitted to Java via DC submarine cable. This development is considered to be five years away. However, development of the coal deposits at Bukit will be financed by a \$50 M IBRD loan and Interimco are bidding on \$11 M of mining equipment for the project. In anticipation of the future requirement for DC transmission in Indonesia, Teshmont recently gave a series of technical presentations to PLN. The remark was made by Mr. K. Sorensen of Monenco that the Indonesians like this sort of thing.

Montreal Engineering is consulting engineer on the thermal power plant at the Soraoka, Sulawaesi, P.T. International Nickel plant.

The power sector in Indonesia must be considered to be one of prime potential for Canadian hydro, thermal and transmission consultants and equipment suppliers. The recent decision of CIDA to become active in this sector should help to strengthen Canada's existing foothold.

#### CIVIL AVIATION

Discussions with Mr. A. S. Sunandie, Directorate General of Air Communications. See also notes on CIDA program.

Indonesia has 43 domestic airports, of which 22 were studied in the CIDA-financed sectorial study by Aviation Planning Services in 1972/73. This leaves 21 airports which have not been evaluated to the level of the APS study. Air Communications are interested in having this work carried out at an anticipated cost of \$500,000 and would welcome a proposal.

Of the 22 airports studied by APS, Air Communications want design work to be carried out on 17 before the end of the second five year plan, i.e. by the end of 1978, to enable construction to be carried out in 1979/80, the first year of the third five year plan. The budget for this work is \$1.2 M.

Both the above projects have been discussed with CIDA, but it appears that CIDA will not support these programs since their policy now is to move out of civil aviation into higher priority sectors such as power. It is a debatable point whether the Indonesians would utilize the EDC line of credit for this work, but this should be investigated.

Chengkareng International Airport - Aeroport de Paris will carry out the detail design work, which will be completed in 1978 under French aid financing of \$5 M. It is anticipated that the third five year plan will include the budget for construction.

Mr. Don Howe, a private consultant, is carrying out a CIDA-financed, regional transportation study (all modes), which will be completed at the end of April. This study may contain additional proposals in the civil aviation sector.

It appears that it may be some years before the CIDA involvement in civil aviation in Indonesia pays off in terms of commercially financed exports, but the foundation has certainly been laid. CDN Research & Development Ltd. are bidding on the \$35 M requirement for 42 fire-fighting vehicles with EDC financing. APS have been appraised of the current situation with respect to airport development and will continue to market their services in this sector.

#### WORLD BANK

Discussions were held with Mr. S. Takahashi, Deputy Director, IBRD, Indonesia.

The World Bank is making loans to Indonesia this year of value \$550 M. The Indonesian government now appears to have a tight hold on spending and borrowing and inflation this year is expected to be less than 15%. The targets of the current five year plan are being achieved. The IBRD budget for FY 1977 is as follows:

	<u>\$ M</u>
Transmigration (from high unemployment regions in Java to Sumatra)	30
Urban Development II	52.5
Ports I	32
PDFCI (relending to private companies)	15
Power IV (Muara Karang, Units 4 and 5)	116



	<u>\$ M</u>
Nutrition	13
Irrigation 8 (loan approval May or June 1977)	59
Irrigation 9	40
<u>Slippage for FY 77</u>	
Pacific Nikkel	50
Infrastructure Development: Gag Island Copper Mining Project (would utilize Sherratt Gordon process)	--
Bukit Assan Coal Project, S. Sumatra	50
- Appraisal mission due. Related to Monenco thermal power project study. Shell involvement in coal mining development.	
Power VII	100
Appraisal mission due in April. IBRD financing one major power project a year.	
Water Supply II	40
7 cities including Surabaya have been studied	
<u>Projected for FY 78/79</u>	
Transmigration II	65
Railways II	60
(preparatory mission report completed)	
Environment - Jakarta	40
(master plan in preparation)	
Power VIII	90
(unscheduled as yet)	
Marine Transport	70
(feasibility study - March 1977)	
etc.	
Total (13 projects)	<u>\$750 M</u>

#### PULP AND PAPER

Leces Paper Mill Project - This is a large integrated project for the use of bagasse to produce fine paper and bleached pulp, the feasibility study for which has been carried out by Stadler Hurter. The value of the project is estimated at \$150 M, with an offshore loan requirement of \$100 M. In addition to the mill, railway and harbour facilities will be required, together with an expansion of the three sugar mills supplying bagasse. The Dept. of Chemical Industries is awaiting approval to proceed with the implementation of the project from Bappinas. I discussed the project with Mr. Fred Hurter, who was in Jakarta at the time, and both he and the post expressed concern at competition from the French and Germans, who were thought to have made specific financing offers at concessional terms.

Since my return, a letter has been sent by the Minister to Dr. Widjojo Nitisastro, Minister of State co-ordinating the Economy, assuring him of CIDA and EDC interest in financing the project and inviting discussions.

Sandwell and SNC/Rust are actively pursuing the next phase of this project, in addition to Stadler Hurter.

#### PORT PROJECTS

Discussed with Soegijanto Wignjo, Port Administrator, Port of Tanjung Priok, Jakarta. Soegijanto was a member of the incoming ports mission in October, 1976.

Soegijanto described the current and future plans for the expansion of Tanjung Priok, the present phase for which Swan Wooster did the master plan and is now doing detail design and project management, has a total budget of \$79.5 M, of which \$32 M is financed by the IBRD. Specifications have been prepared for international bidding of major equipment requirements and Canadian suppliers have been alerted.

Future expansion plans were discussed, including a new container terminal which will involve the demolition of an existing residential area. There appears to be adequate room for future expansion at the same site.



The way in which, over a period of a few years, Swan Wooster has become the leading port consultant in Indonesia, is a credit to them and could be an object lesson for other Canadian consultants who so often fail to capitalize on their initial success in a country.

Other activities of Swan Wooster in Indonesia include:

- consultant on \$68 M IBRD-financed fertilizer distribution project.
- construction supervision on \$80 M Tonasa cement plant. Consulting engineer, port for Tonasa. The overall contract for this plant is with Coutinho Caro of Canada.
- Consultant, feasibility study, transport Sumatra coal to thermal power station, West Java.

\* \* \*

INDONESIA - THERMAL POWER - DEPT. OF PUBLIC WORKS & POWER (PLN)

<u>TITLE</u>	<u>LOCATION</u>	<u>DESCRIPTION</u>	<u>IMPLEMENT</u>	<u>COST</u>	<u>STATUS</u>	<u>NEW STATUS</u>
Bukit Asam	Bukit Asam S. Sumatra	4 x 50 MW Coal fired	1976-82	Total \$177 M Local \$47 M Foreign \$130 M	Site selected and surveyed	Need financing for feasibility study. Aid or technical assistance (CIDA refused)
Muara Karang Units 4 & 5	Jakarta West Java	3 x 100 MW installed, 2 x 200 MW 4 and 5	1976-80	Total \$260 M Local \$45 M Foreign \$215 M	Site selected - C.T. Main study IBRD approached for financing	4th unit being negotiated
Cilincing West Java	Jakarta	2 x 375 MW and 380 KV to Bandung	1976-82	Total \$245 M Local \$45 M Foreign \$200 M	Site available - studies by PLN	Site selection and feasibility study, Monenco, \$250,000 - IBRD financing
Semarang II	Semarang C. Java	2 x 200 MW and 380 KV	1976-82	Total \$275 M Local \$65 M Foreign \$210 M	Long range study by C.T. Main	IBRD appraisal mission in Indonesia now
Gresik I & II	Gresik E. Java	2 x 100 MW	1976-82	Total \$145 M Local \$40 M Foreign \$105 M	Site available Feasibility by Japanese Tech. Assistance	Japanese - soft loan for feasibility study
Ujung Pandang	S. Sulawesi	3 x 30 MW & 2 x 12 MW diesels	1976-81	Total \$102 M Local \$25 M Foreign \$77 M	ADB loan - New Zealand consultant	Turned down by CIDA No source of financing identified yet



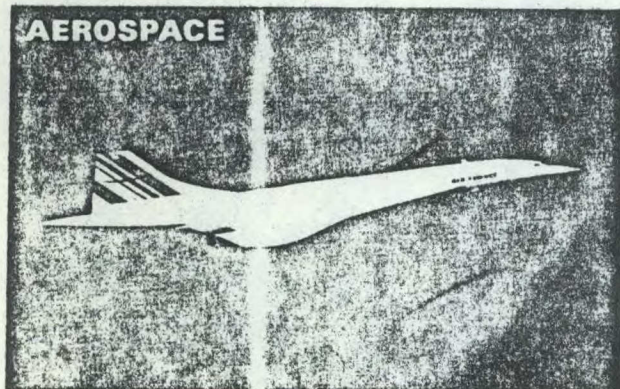
**TRANSPORT**



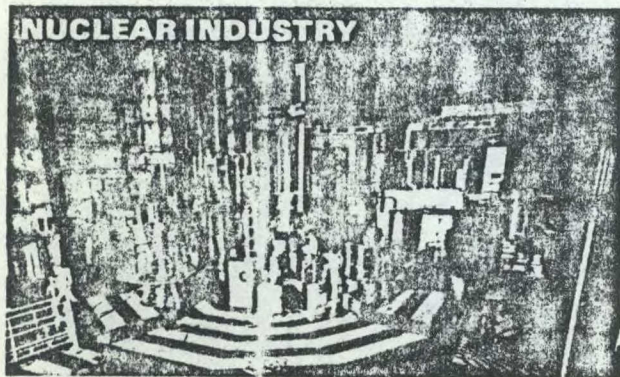
**MECHANICAL**



**AEROSPACE**

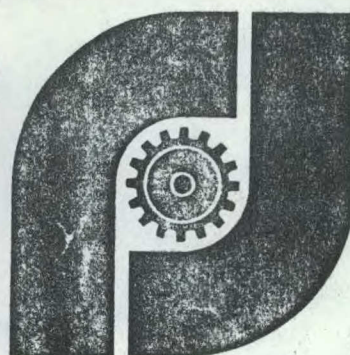


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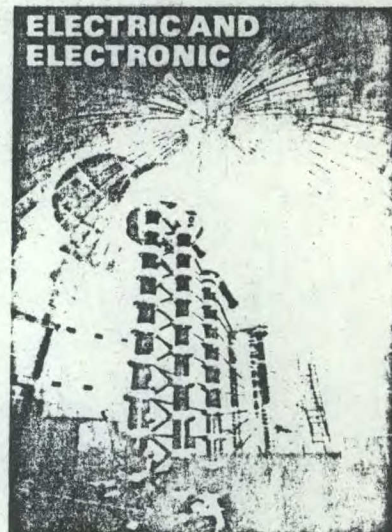
**26 March -  
3 April 1977.**

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EXHIBITORS**

**30  
SECTORS**

**100  
TECHNICAL  
LECTURES**

**ELECTRIC AND  
ELECTRONIC**



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