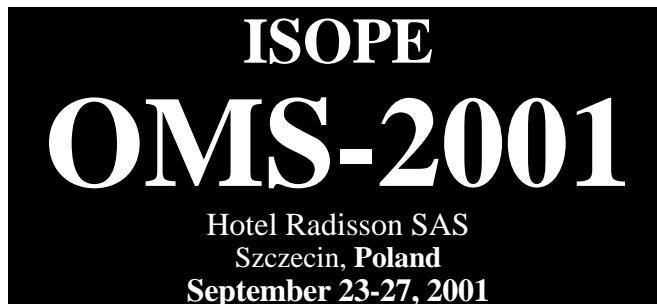


September 23-27, 2001
Szczecin, Poland

The Fourth (2001) ISOPE
**Ocean Mining
Symposium**



Technical Program

Invited and Refereed Papers

Environment	Mining Systems & Technology
	Deepwater Production
Exploration & Survey	Materials and Processing

Organized by:
International Organizing Committee

Sponsored by:
International Society of Offshore and Polar Engineers (ISOPE) with
cooperating organizations (list inside)
Interoceanmetal Joint Organization (IOM)

ISOPE OMS-2001 secretariat
Attn.: Dr. Valcana Stoyanova
Interoceanmetal Joint Organization
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E-mail vs@iom.gov.pl; Web site: www.iom.gov.pl



Visit
www.isopec.org

IOM

Radisson SAS Hotel Szczecin

Waly Chrobrego

at ISOPE OMS-99 Goa

Welcome to ISOPE OMS-2001

We greatly appreciate the excellent responses and help we have received from colleagues around the world in the successful organization of the 4th ISOPE Ocean Mining Symposium (ISOPE OMS-2001), Szczecin, Poland, September 23-27, 2001. The symposium features **10 sessions of refereed papers** and **1 workshop on environment** from 14 countries.

The 1st (1995) ISOPE Ocean Mining Symposium (ISOPE OMS-95) was held in Tsukuba. An informal organizational meeting of **Ocean Mining Working Group (OMWG)** was held in Tsukuba, Japan, on November 22, 1995. At the meeting, representatives from 7 countries desired to have a close international cooperation and more exchange of the individuals' progress, and agreed to establish a non-governmental body, OMWG, which can also act as an informal channel among the governments: The OMWG concept got blessing from director generals of the participating governments: US, France (Ifremer joined later), Germany, Japan, IOM, Korea, India, and China (joined later). The OMWG covers exploration and survey, environment, mining systems, and processing systems.

The primary objectives of the OMWG are:

- to advance at an international level technological progress in the interdisciplinary field of ocean resources, environment and mining and related technologies, through international cooperation and participation;
- to disseminate scientific knowledge and provide timely exchange of technical knowledge and information;
- to provide opportunities through its programs for interested individuals to maintain and expand their knowledge in these fields for the benefit of engineering and scientific profession.

to facilitate opportunities for the members to interact with their governments. The International Society of Offshore and Polar Engineers (ISOPE) facilitates the OMWG activities.

The 2nd OMS-97 and 3rd OMS-99 were successfully held in Seoul, Korea, and Goa, India, respectively, with participation from 12 countries.

On behalf of the International Organizing Committee, it is our pleasure to welcome participants to the ISOPE OMS-2001 Symposium in Szczecin.

Co-chairmen of the ISOPE OMS-2001 Symposium

Jin S. Chung, USA
Ryszard Kotlinski, Poland
Tetsuo Yamazaki, Japan

SUNDAY September 23

15:00
OMS-01 Executive Committee Meeting Conference Room

16:00
Ocean Mining Working Group (OMWG) Meeting Conference Room

19.00-21.00
IOC reception Park Hotel Restaurant
Host: Director General of IOM

For Tour Information (see the Bulletin board at the Foyer)

MONDAY September 24

08.30 -10.00
Symposium Registration Foyer

09:00
Opening Address Norwid

09.20 -10.30
1. OPENING SESSION Norwid

11.00-12.30
2. EXPLORATION AND SURVEY Norwid

13.00-14.00
Group Lunch Concerto

14.00-15.30
3. ENVIRONMENT I Norwid

16.00-18.00
4. ENVIRONMENT II Norwid

19.30-21.30
SYMPOSIUM RECEPTION Banquet Hall Vivaldi's

TUESDAY September 25

09.00 –10:30
5. MINING TECHNOLOGY & SYSTEMS I Norwid

11.00-12.30
6. MINING TECHNOLOGY & SYSTEMS II Norwid

13.00-14.00
Group Lunch Concerto

14.00-15.30
7. MINING TECHNOLOGY & SYSTEMS III Norwid

16.00-19.00
8. MINING TECHNOLOGY & SYSTEMS IV Norwid

Monday - Wednesday
Audio/Visual Practice Training Hall
On-site Registration Foyer

WEDNESDAY September 26

09.00-10:30 9. PROCESSING TECHNOLOGY I	Norwid
11.00-13.00 10. PROCESSING TECHNOLOGY II	Norwid
13.00-14.00 Group Lunch	Concerto
14.00-15.30 CLOSING SESSION	Norwid
16.00-19.00 EXCURSION	City tour

THURSDAY, September 27

09.00 – 19.00
SYMPOSIUM FIELD TOUR: State strategy for the protection of Nature on the Wolin Island. Visit to the Wolinski National Park and to Kamen Pomorski town. (see “General Information” in this program).

Cosponsored by:
International Society of Offshore and Polar Engineers (ISOPE)
Interoceanmetal Joint Organization (IOM)

Cooperated by:
International Society of Offshore and Polar Engineers (ISOPE)
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Mining and Materials Processing Institute of Japan (MMIJ)
Korea Association for Deep Ocean Minerals Development (KADOM)
Korea Committee for Ocean and Resources Engineering (KCORE)
National Institute of Oceanography (NIO, India)
Interoceanmetal Joint Organization (IOM, Poland)
Ifremer (France)
Kansai Society of Naval Architects of Japan (KSNJ)
China Ocean Mineral Resources R&D Association (COMRA)

Secretariat:
Dr. Valcana Stoyanova, IOM, Szczecin, Poland

Technical Executive Committee:
Prof. Jin S. Chung, ISOPE, Cupertino, California, USA
Dr. Ryszard Kotlinski, IOM, Szczecin, Poland
Dr. Tetsuo Yamazaki, Institute for Marine Resources and Environment,
AIST, Tsukuba, Japan

International Organizing Committee
Prof. Jin S. Chung (**Chairman**), ISOPE, Cupertino, California, USA
Dr. R.P. Das, Regional Research Lab., Bhubaneswar, India
Dr. Sup Hong, Korea Research Inst. of Ship and Ocean Engineering, Korea
Dr. R. Kotlinski, IOM, Szczecin, Poland
Dr. M. Olagnon, Ifremer, France
Dr. K. Otsuka, Osaka Prefecture University, Osaka, Japan
Dr. G. Schriever, BIOLAB Forschungsstitut, Germany
Dr. R. Sharma, National Institute of Oceanography, Goa, India

Dr. A. Usui, Institute for Marine Resources and Environment, AIST,
Tsukuba, Japan
Dr. Valcana Stoyanova, IOM, Szczecin, Poland
Dr. T. Yamazaki, Institute for Marine Resources and Environment, AIST,
Tsukuba, Japan
Dr. Ning Yang, Changsha Research Institute of Mining and Metallurgy,
Changsha, China

Conference Co-chairmen

Jin S. Chung, ISOPE, Cupertino, California, USA
R. Kotlinski, IOM, Szczecin, Poland
Dr. Tetsuo Yamazaki, Institute for Marine Resources and Environment,
AIST, Tsukuba, Japan

TECHNICAL PROGRAM

Opening Address

Monday 09:00 Norwid
Dr. Tadeusz Bachleda-Curus, Vice Secretary and Principal Geologist of
the State, Ministry of Environment, Poland

1. OPENING SESSION

Monday 09:20 Norwid
Chair: *Jin S. Chung*, ISOPE, Cupertino, California, USA
Co-Chair: *Valcana Stoyanova*, Interoceanmetal Joint Organization, Poland

Mineral Resources of the World's Oceans – Their Importance for Global Economy in the 21st Century

Ryszard Kotlinski, Interoceanmetal Joint Organization, Szczecin,
Poland.

Development in Deep Seabed Mining in Indian Ocean

S.K. Das, Department of Ocean Development, New Delhi, India

Deep Seabed Mining Environment Test: Engineering and Environmental Assessment (I)

Rahul Sharma, National Institute of Oceanography, Goa, India; Tetsuo
Yamazaki, Institute for Marine Resources and Environment, Tsukuba,
Japan; Jin S Chung, OERC Inc, Cupertino, CA, USA; Gerd Schriever,
Forschungsinstitut, Hohenwestedt, Germany

2. EXPLORATION AND SURVEY

Monday 11:00 Norwid
Chair: *Yuri Kazmin*, Interoceanmetal Joint Organization, Poland
Co-chair: *A. Usui*, Institute for Marine Resources and Environment, AIST,
Tsukuba, Japan

Drilling Survey Around the Suiyou Seamount in the Izu- Ogasawara Arc, Japan

Nobuyasu Nishikawa, Metal Mining Agency of Japan, Tokyo, Japan

Geological Control of Regional and Small-scale Variability of Marine Ferromanganese Deposits in the Northwest Pacific

A Usui, Institute for Marine Resources and Environment, Tsukuba, Japan

Factors in Finding and Proving Seafloor Massive Sulphate Resources

Julian Malnic, Cameron Rees, Nautilus Minerals Corporation, Darlinghurst NSW, Australia, Mining Research Center, University of New South Wales, Sydney NSW, Australia

Platinum Group Elements in Polymetallic Nodules Within Clarion-Clipperton Ore Field

Ryszard Kotlinski, Interoceanmetal Joint Organization, Szczecin, Poland, Karel Rezek, Institute of Mineral Raw Materials, Hutna Hora, Czech Republic.

Specialized Engineering Geological Research Within Clarion-Clipperton Ore Field

A.B.Kondratenko, Y.B.Neizvestnov, VNIIOkeangeologia, St. Petersburg, Russia

3. ENVIRONMENT I

Monday 14:00 Norwid
Chair: *Teresa Radziejewska*, Agricultural University, Szczecin, Poland
Co-chair: *R. Sharma*, National Institute of Oceanography, Goa, India

Environmental Impact Research on Marine Eco-system for Deep-sea Mining

Takaaki Matsui and Eiji Kuboki, Metal Mining Agency of Japan, Tokyo, Japan

Changes in Genus-Level Diversity of Meiobenthic Free-Living Nematodes (Nematoda) and Harpacticoids (Copepoda Harpacticoida) at an Abyssal Site Following Experimental Sediment Disturbance

Teresa Radziejewska, Agricultural University, Szczecin, Poland, Valentina V.Galtsova, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia, Idzi Drzycimski, Agricultural University, Szczecin, Poland, Lena V.Kulangieva, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia, Valcana Stoyanova, InterOceanMetal Joint Organization, Szczecin, Poland.

Results of Sediment Powderisation During Hydraulic Transportation Test

Rahul Sharma, National Institute of Oceanography, Goa, India and Tetsuo Yamazaki, Institute for Marine Resources and Environment, Tsukuba, Japan

Evaluation of Physical Environmental Consequences of Deep-Sea Mining.

Horst U. Oebius, Technical University of Berlin, Germany.

Comparison of Geochemical and Geotechnical Sediment-Baseline Profiles of COMRA (CCFZ) and TUSCH (Peru Basin) Invest Areas in the Scope of Mn-Nodule Mining.

B. Grupe, M. Maggiulli, Technical University of Berlin, Germany, H.-Y. Zhou, J.-Y. Ni; Second Institute of Oceanography, State Oceanic Administration, Hangzhou, China.

4. ENVIRONMENT II

Monday 16:00 Norwid
Chair: *G. Schriever*, BIOLAB Forschungsstitut, Germany
Co-chair: *Tomohiko Fukushima*, Marine Biological Research Inst. of Japan Co., Japan

IOM BIE Revisited: Meiobenthos at the IOM BIE Site 5 Years After the Experimental Disturbance

Teresa Radziejewska, Joanna Rokicka-Praxmajer Department of Oceanography, Agricultural University, Szczecin, Valcana Stoyanova Interoceanmetal Joint Organization, Szczecin, Poland.

A New Benthic Impact Experiment on a Seamount

Tetsuo Yamazaki, Institute for Marine Resources and Environment, Tsukuba; Eiji Kuboki and Takaaki Matsui, Metal Mining Agency of Japan, Tokyo, Japan

Seafloor Impact and Monitoring of Benthic Disturbance in Central India Basin

Rahul Sharma, National Institute of Oceanography, Goa, India

The Response of Deep-sea Benthic Organisms to Experimental Removal of the Surface Sediment

Tomohiko Fukushima, Marine Biological Research Inst. of Japan Co., Ltd. Yoshihisa Shirayama, Seto Marine Biological Lab., Kyoto Univ. Takaaki Matsui, Deep Ocean Resources Development Co., Ltd. Eiji Kuboki, Metal Mining Agency of Japan

Environmental Management of Tailings from Deep-Sea Mining Through Soil Engineering

John Wiltshire, Kathleen Moore, University of Hawaii, Honolulu, USA, Tom Loudat, Consultant to the State of Hawaii, Honolulu, USA, TerrLay, Department of Mining and Metallurgical Engineering, Dalhousie University, Halifax, Canada.

5. MINING TECHNOLOGY & SYSTEMS I

Tuesday 09.00 Norwid
Chair: *T. Yamazaki*, Institute for Marine Resources and Environment, AIST, Tsukuba, Japan
Co-chair: *Chi Ho Yoon*, Korea Institute of Geology, Mining and Materials, Daejeon, Korea

Deep-Ocean Mining Systems and Technology: Spin-off for Petroleum Technology

Chung, JS, OERC Inc, Cupertino, CA; USA

A Dynamic Simulation of Deep-Seabed Mining System

Sup Hong, Hyun-Jo Kim, Yoon Rak Choi, Jong-Su Choi, Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea:

Hyung-Suk Han, Korea Institute of Machinery and Materials, Daejon, Korea

Deep Ocean Mining Reconsidered

Trygve Lund, Aker Technology AS, Oslo; Jan Magne Markussen, The Fridtjof Nansen Institute, Lysaker; Fredrik Søreide, Norwegian University of Science and Technology, Trondheim, Norway

6. MINING TECHNOLOGY & SYSTEMS II

Tuesday 11.00 Norwid

Chair: *Sup Hong*, Korea Research Inst. of Ship and Ocean Eng, Korea

Co-chair: *K. Ouchi*, Ouchi Ocean Consultant Inc., Japan

Developmental Tests on the Underwater Mining System Using Flexible Riser Concept

C.R. Deepak, M. Shajahan, M.A. Atmanand, K. Annamalai, R. Jeyamani, M. Ravindran, National Institute of Ocean Technology, Chennai, India; E. Schulte, R. Handschuh, J. Panthel, H. Grebe, W. Schwarz, University of Siegen, Siegen, Germany

Innovative Deep Ocean Mining Concept Based on Flexible Riser and Self-Propelled Mining Machines

R. Handschuh, H. Grebe, J. Panthel, E. Schulte, B. Wenzlawski, W. Schwarz, University of Siegen, Siegen, Germany; M.A. Atmanand, R. Jeyamani, M. Shajahan, R. Deepak, M. Ravindran, National Institute of Ocean Technology, Chennai, India

Instrumentation and Control System of a Sand Mining System for Shallow Water

E. Schulte, H. Grebe, R. Handschuh, J. Panthel, B. Wenzlawski, W. Schwarz, Institut für Konstruktion Siegen (IKS), University of Siegen, Siegen, Germany; M.A. Atmanand, R. Deepak, R. Jeyamani, M. Shajahan, M. Ravindran, National Institute of Ocean Technology, Chennai, India

Experimental Study on Grouser Shape Effects for Traction on Extremely Soft Seabed

Sup Hong, Jong-Su Choi, Korea Research Institute of Ships and Ocean Engineering, Daejon, South Korea:

7. MINING TECHNOLOGY & SYSTEMS III

Wednesday 14.00 Norwid

Chair: *Jerzy Sobota*, Institute of Environmental Engineering, Agricultural University, Wroclaw, Poland

Co-chair: *C.R. Deepak*, National Institute of Ocean Technology, Chennai, India

Recent Researches on Deep Ocean Water Applications in Japan

Koji Otsuka, Osaka Prefecture University, Osaka, Japan
Japan

Conceptual Design of a Deep Ocean Water Upwelling Structure for Development of Fisheries

S. Ogiwara, Y. Awashima, H. Miyabe, Ishikawajima-Harima Heavy Industry Co. Ltd., Tokyo; K. Ouchi, Ouchi Ocean Consultant Inc., Nagano, Japan

Feasibility Study for Energy Source of Deep Sea Upwelling Machine

K. Ouchi, Ouchi Ocean Consultant Inc., Nagano; S. Jitsuvara, Satomi Sangyo Ltd., Tokyo, Japan

An Experimental Study on the Flow Characteristics of Solid-Liquid Two-Phase Mixture in a Flexible Hose

Chi Ho Yoon, Kwang Ho Kwon, Seok Ki Kwon, Dong Kil Lee, Korea Institute of Geology, Mining and Materials, Daejon; Won Mo Sung, Hanyang University, Seoul; Yong Chan Park, In Kee Kim and Ou Kwang Kwon, Korea Institute of Geology, Mining and Materials, Daejon; Korea

8. MINING TECHNOLOGY & SYSTEMS IV

Tuesday 16:00 Norwid

Chair: *K. Otsuka*, Osaka Prefecture University, Osaka, Japan

Co-chair: *Antonin Parizek*, Interoceanmetal Joint Organization, Poland

Slip Velocity in Nodules Vertical Flow – Experimental Results

J. Sobota, S. Boczarski, Institute of Environmental Engineering Agricultural University, Wroclaw, Poland, L. Petrika, University of Mining and Metallurgy, Krakow, Poland, R. Kotlinski, V. Stoyanova, Interoceanmetal Joint Organization, Szczecin, Poland.

Pressure Drop During Water-Nodules Mixture Flow in Vertical pipeline

J. Sobota, S. Boczarski, Institute of Environmental Engineering Agricultural University, Wroclaw, Poland, Weisheng Zou, Jiazhen Huang, Changsha Research Institute of Mining and Metallurgy, Changsha, China.

Effect of Particle Size on Pressure Drop in Two-Phase Vertical Transport of Particles

Chung, JS, OERC Inc, Cupertino, CA; Lee, K, Kiewit Construction, Omaha, Nebraska; and Tischler, A, Aera Energy, Bakersfield, CA, USA

Hydraulic Losses Prognosis of Coarse Particles Flows in Vertical Pipes

E. Bournaski, I. Ivanov, Institute of Water Problems, Bulgarian Academy of Sciences, Sofia, Bulgaria, J. Sobota, Institute of Environmental Engineering Agricultural University, Wroclaw, Poland, V. Berman, Institute of Hydromechanics, National Academy of Sciences of Ukraine, Kiev, Ukraine

9. PROCESSING TECHNOLOGY I

Wednesday 09:00 Norwid

Chair: *Frantisek Vranka*, Interoceanmetal Joint Organization, Szczecin, Poland

India's Demonstration Metallurgical Plant to Treat Ocean Nodule

R.P.Das, Regional Research Laboratory, Bhubaneswar, India

Hydrometallurgical Recovery of Metals from Polymetallic Deep-Sea Nodules after Their Reductive Dissolution

Jitka Jandova, Prague Institute of Chemical Technology, Prague, Czech Republic, Tomas Grygar, Institute of Inorganic Chemistry, Academy of Sciences of the Czech Republic, Rez, Czech Republic, Vu N.Hong, Prague Institute of Chemical Technology, Prague, Czech Republic, Jaroslav Bohacek, Institute of Inorganic Chemistry, Academy of Sciences of the Czech Republic, Rez, Czech Republic, Katerina Lisa, Prague Institute of Chemical Technology, Prague, Czech Republic,

Hydrometallurgical Technology of Recovery of Valuable Constituents from Manganese Ores of the World Ocean

Alexander Romanchuk, Central Research Institute of Geological Prospecting for Base and Precious Metals (TSNIGRI), Moscow, Russia

10. PROCESSING TECHNOLOGY II

Wednesday 10:30 Norwid
Chair: *R P Das*, Regional Research Lab, Bhubaneshwar, India

Optimization of Technologies for Processing of the Polymetallic Nodules

Frantisek Vranka, Interoceanmetal Joint Organization, Szczecin, Poland

Marine Nodule Sample Processing from Interoceanmetal Ore Body in The Pacific Ocean Using Acid Leaching Pressure Technology

Pedro Miguel Pelegrin, Rodrigues, Ariel Mosqueda Martinez, Center of Investigation of Laterite, Moa-Holguin, Cuba.

Polymetallic Marine Nodules Leaching Using SO₂ as Principal Reagent

Pedro Miguel Pelegrin, Rodrigues, Ariel Mosqueda Martinez, Center of Investigation of Laterite, Moa-Holguin, Cuba.

11. CLOSING SESSION

Wednesday 14:00 Norwid
Chair: *Ryszard Kotlinski*, Interoceanmetal Joint Organization, Poland

Summary reports from individual session chairs
Closing Notes

Excursion

Wednesday 16:00 City tour

GENERAL INFORMATION

PLACE AND DATE: Szczecin, Poland; September 23-27, 2001.

ISOPE OMS-2001
Radisson SAS Hotel
10, Plac Rodla, 70-419 Szczecin, Poland
Fax: +48-91 3595 018
Tel: +48-91 3595 109

Hotel is located in the heart of the city.

ACCESS TO SZCZECIN

By Air: Szczecin is well connected (2-3 flights daily) by air with the International Airports at Warsaw. Szczecin has also daily direct flight connection with Copenhagen. Some participants can use Tigel Airport at Berlin.

By Rail: Train service from Central Railway Station at Warsaw to Szczecin-Glovnny is also available. The travel takes about 6 hours. The 1st class ticket price is about 100 PLN.

Shuttle bus transfer from Tigel Airport in Berlin to Radisson SAS Hotel Szczecin is available to be advance-arranged for 15 USD/person. Distance from Berlin Airport to Szczecin is about 110 km. The trip by bus to Radisson SAS Hotel Szczecin takes about 2 hours.

PARKING

Hotel parking is available for 7USD/day.

LANGUAGE

The language for the conference is English. No translation service will be arranged.

CURRENCY EXCHANGE

Currency can be exchanged either in the Hotel or banks for the most favorable rates. For example, the 4 May 2001 exchange rate is: 1 USD = 3.96 PLN, 1 EUR = 3.53 PLN, 1 GBP = 5.67 PLN, 100 JPY=3.27 PLN.

AIRPORT to Hotel Radisson SAS (see the map in this program)

All flights to Szczecin arrive at the Goleniow Airport, about 40 km away from the symposium venue. Airport shuttle bus (free of charge) to Hotel. Every flight from and to Szczecin (Goleniow airport) is serviced by shuttle bus is provided. The bus trip takes about 50 minutes. Taxis are also available at the Airport for 100 PLN.

Shuttle bus transfer from Tigel Airport in Berlin to Radisson SAS Hotel Szczecin is available to be advance-arranged for 15 USD/person. The trip to Radisson SAS Hotel takes about 2 hours. Please, *fax or e-mail* well in advance to Secretariat for **advance arrangements**. The participants can use the hotel shuttle bus (10 seats) and IOM[®] bus and car (9 and 4 seats, respectively).

HOTEL ACCOMMODATION:

Reservation Form inside back cover must be used. Only a limited number of rooms at OMS-2001 rates are available at the symposium venue.

Guaranteed reservation by AUGUST 20.

Voltage: The voltage for electrical power supply is 220 V, 50 Hz.

CITY TRANSPORTATION

Pick up a local tourist information booklet at the registration desk. Local buses run regularly to all points of the city.

SYMPOSIUM FIELD TOUR, September 27: 09:00-19:00; USD20.

A field trip will be organized on 27 September, to the Wolin Island, the location of Wolinski National Park with area of almost 225 ha on the island and 6 sectors under strict preservation conditions, and visit to the

Roman-Gothic Cathedral of XII-XIII century in Kamen Pomorski town with organ concert in the Cathedral.

The field tour starts at 9.a.m. First is the visit to Kamen Pomorski town (85 km away from the hotel) with organ concert in the Oldest Cathedral. Next the rout leads along the Baltic coast (about 30 km) to Wolinski National Park situated on the Wolin Island. There the participants will acquaint with unique seaside forests, lakes, as well as the preserve of bison, a wide variety of predatory and water birds etc. There will be a picnic with famous delicious Polish kitchen, folk music, and Viking's attractions. ~~The~~ Return to the hotel at 17.30–18.00.

OTHER TOURS

Full day sight seeing tours can be booked from the hotels.

ADVANCE SYMPOSIUM REGISTRATION BY MAIL OR FAX

(use the Registration Form)

All persons attending the symposium are required to register, pay the appropriate fee, and get a conference badge. Remember to send via airmail the Advance Registration (*and Invoice*) Form in this Program or a copy to reach **before AUGUST 20: ISOPE OMS-2001 Secretariat, Interoceanmetal Joint Organization, ul.Cyryla i Metodego 9, 71-541 Szczecin, Poland, Fax: +48-91 4539 399**. In case one charges to a credit card via **FAX**, the card number should be typed in bold face or written clearly to be readable in the transmitted fax copy.

Use the Advance registration Form in this program or a copy. Registration fees (note US\$50 surcharge after August 20 for on-site registration) are as follows:

Category	Registration Fee* (US Dollars)	
	Before August 20	After August 20
Author, Co-authors, Panelist	250	300
Session or Symposium Chair, Co-Chair	250	300
New ISOPE member application (incl. Yr. 2002 membership fee and one year journal issues)	340	390
Spouses (no proceedings/no luncheon ticket)	N/C	N/C
Full-time Student with 2001 ID Card	100	100

* The Symposium registration fee includes the symposium reception, 3 daily group lunch, tea breaks, and a symposium proceedings.

REGISTRATION CANCELLATIONS

Request for cancellation of registration must be received in writing by **September 7, 2001** to be granted a refund minus US\$50 processing charge.

REGISTRATION BADGE

Registration badges are required for admittance to all the symposium activities, including the reception and lunch.

ON-SITE SYMPOSIUM REGISTRATION

Participants who miss the advance registration may register at the Symposium Registration Desk, but there is a US\$50 surcharge. The registration desk will be open during the following hours:

Monday, Sept. 24 08:00-16:00 Tuesday, Sept. 25 09:00-14:00

ISOPE PUBLICATION ORDER

A copy of **ISOPE OMS-2001 Symposium Proceedings** (ISBN 1-880653-56-7) is included in the symposium registration fees. The proceedings volumes (280 pp. est.) can be ordered by mail at the rates of:

Mail order at \$100 (ISOPE Member \$80) including shipping charge.

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PRESS - The press is invited to register at: Registration Desk

SYMPOSIUM HEADQUARTERS Registration Desk

SYMPOSIUM RECEPTION
19:00-21:00 MONDAY Banquet Hall Vivaldi's

AUDIO VISUAL PRACTICE ROOM Session Room
An overhead projector, 35 mm slide projector, multimedia projector and screen will be set up from 08:00-17:00 (Monday and Tuesday) in the session room. For any specific requirements for presentations, participants may contact : Dr. Valcana Stoyanova, Interoceanmetal Joint Organization, ul. Cyryla i Metodego 9, 71-541 Szczecin, Poland (Fax +48-91 4539 399; Tel: +48-91 4539 398; E-mail: vs@iom.gov.pl).

INTERNATIONAL PARTICIPANTS AND VISA APPLICATION
International authors, participants or attendees who need help (except financial) can contact: **Dr. Valcana Stoyanova, ISOPE OMS-2001 Secretariat, Interoceanmetal Joint Organization, Cyryla i Metodego 9, 71-541 Szczecin, Poland (Fax +48-91 4539 399; Tel: +48-91 4539 398; E-mail vs@iom.gov.pl).**

Entry Visa. Some authors may be required to apply for an entry visa. Please get an application form at the Embassy/Consulate of Republic of Poland in your country. If the Consulate requires you to submit an official letter of invitation, please contact **Dr. Valcana Stoyanova, OMS-2001 Secretariat, Szczecin, Poland.** Visitors from most European countries and USA do not require a visa. However it is recommended that participants consult at travel agency. Further information can be obtained with e-mail to: msz_konsul@ikp.pl and www.msz.gov.pl/english/indexangel.html.

About Szczecin
Szczecin is the capital of the Western Pomeranian region of Poland. Situated on the Odra River, 12 km from the German-Polish border, Szczecin is one of the most important port towns on the Baltic Sea and center for the shipyard industry. An old Slavonic castle, city walls, gates, various religious establishments, museums, galleries, parks are known for their interesting offer. The tourist infrastructure of the Province of Western Pomerania is one of the best in Poland.

Climate And Clothes. The weather in Poland during September is mainly warm (temperatures usually are between 15°C and 22°C). Also it may rain, and umbrella or raincoat and warm clothing are recommended.

About IOM
An Intergovernmental Agreement founded Interoceanmetal Joint Organization (IOM) in 1987 with purpose to carry out exploration and exploitation of polymetallic nodules within the eastern part of Clarion-Clipperton Fracture Zone in the Pacific Ocean. The headquarters of the

IOM are in Szczecin, Republic of Poland. IOM was registered on 5 July 1992 as a pioneer investor according to Resolution II of the Final Act of UN Convention on the Law of the Sea. On 29 March 2001 IOM signed a contract for exploration with International Seabed Authority for a period of fifteen years. The sponsoring states of the IOM's activity are as following: Republic of Bulgaria, Republic of Cuba, Republic of Poland, Russian Federation, Slovak Republic and Czech Republic.

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Fax 1-408-980-1787: E-mail meetings@isopec.org

Prospective authors are invited to submit abstract to:

ISOPE-2002 Kyushu

The 12th (2002) International
Offshore and Polar Engineering Conference
KitaKyushu, Japan, May 26–31, 2002

*Special ISOPE room rates at 4-star hotel starts from
9,500 Yen (about 80 U.S. dollars)*

Call For Papers

ABSTRACT DEADLINE: September 30, 2001

Send (fax or e-mail) your abstract in 300-400 words to: (1) One of the TPC members (session organizers), (2) **ISOPE-2002 TPC**, ISOPE, P.O. Box 189, Cupertino, California 95015-0189, USA: Fax 1-408-980-1787; meetings@isopec.org or (3) Online submission directly to www.isopec.org. (*Further details from www.isopec.org*)

Berlin Airport, Goleniow Airport and Train Station to Szczecin and
Radisson SAS Hotel Szczecin (Find details in General Information.)

HOTEL RESERVATION FORM (must use this form)
Radisson SAS Hotel Szczecin
September 23-27, 2001

Radisson SAS Hotel Szczecin is the official venue for the Symposium. For **guaranteed reservation**, this form must be received **via either fax or airmail** only and no later than **AUGUST 20:**

Group Reservation ISOPE OMS-2001
Radisson SAS Hotel Szczecin
10, Plac Rodla
70-419 Szczecin, Poland
Fax: +48-91 3595 018
Tel: +48-91 3595 109

First (Fore)
Surname: _____ & Middle: _____
Circle: Male Female; Title Mr. Ms. Mrs. Prof. Dr.
Company: _____
Address _____

Country _____ Postal (ZIP) Code _____
Fax No. _____

Arrival: September __ Time ____; Depart.: _____, Time ____

Hotel room rates per night* (all prices in USD):

Room Choice: <i>(Circle One)</i>	Single	Double
<input type="checkbox"/> Standard room	70	85
<input type="checkbox"/> Superior	80	95
<input type="checkbox"/> Business Class room	85	100

Name of the person to share: _____

* Rates include breakfast buffet, VAT, free entrance to Fitness Club, free entrance to Night Club. For more information see: www.radissonsas.com.

Methods of Payment. No advance deposit is required. Pay directly to the Hotel as you check in. All common Credit cards or cash payments are accepted. Cancellation must be notified in advance in writing to ISOPE OMS-2001 Secretariat so that the room can be released to others on the waiting list.

Signature: _____ Date: _____, 2001

Photocopy, Complete, and Send This Form

Reservation after **AUGUST 20** is subject to room availability.

TECHNICAL PROGRAM
ISOPE OMS-2001 Szczecin
Szczecin, Poland
September 23-27, 2001

Find Forms for the Hotel Reservation and Advance Registration inside this program.

Venue Address:

ISOPE OMS-2001
Radisson SAS Hotel Szczecin
10, Plac Rodla, 70-419 Szczecin, Poland
Fax: +48-91 3595 018
Tel: +48-91 3595 109

Plan to Attend Other ISOPE Meetings

ISOPE–2002 Kyushu, Japan

May 26–31, 2002

Abstract Deadline: September 1, 2001

For Call For Papers, visit <http://www.isope.org> and submit online or fax an abstract to +1-408-980-1787 USA

ISOPE PACOMS-2002 Daejon, Korea

November 17-20, 2002

Visit <http://www.isope.org> and fax an abstract to PACOMS-2002 at +82-42-868-7519, Korea or +1-408-980-1787, USA

ISOPE–2003 Honolulu, Hawaii, USA

ISOPE EUROMS-2003 Europe: Venue and date to be announced.

ISOPE OMS–2003: Venue and date to be announced.



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Offshore and Polar Engineers (ISOPE)**
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