

# ICSBOC' 08

The 6<sup>th</sup> International Cable Supported Bridge  
Operators' Conference

May 22 to 24, 2008  
Kagawa International Conference Hall  
Takamatsu, JAPAN

Organized by



Honshu-Shikoku Bridge Expressway Co., Ltd.

Supported by

Japan Society of Civil Engineers  
Shikoku Railway Company



Akashi Kaikyo Bridge



Seto Ohashi Bridges

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# Welcome to Japan and the 6<sup>th</sup> ICSBOC



President  
Honshu-Shikoku Bridge Expressway Co., Ltd.

It is a great pleasure for us to host the 6<sup>th</sup> International Cable Supported Bridge Operators' Conference and to welcome a lot of operators from various countries.

We, Honshu-Shikoku Bridge Authority at that time, hosted the 3<sup>rd</sup> Conference in 2002. The topics of the conferences have been technical issues on the maintenance of cable supported bridges since the 4<sup>th</sup> ICSBOC, as the conference name was revised. The number of participatory countries has been increasing step by step. It means the interest for bridge maintenance has risen and the importance of the conference has been recognized by the operators.

I am expecting that the exchanges of technical information concerning the maintenance of cable supported bridges through presentations will be developed in this Conference as well as the previous conferences.

I think more advanced maintenance techniques for long-span bridges should be developed by good coordination between the operators and various fields of engineers. I hope such coordination will be established and more innovative techniques will be developed through the future conferences.

By the way, the Seto Ohashi Bridges, which are adjacent to Takamatsu, marked the 20<sup>th</sup> anniversary in April 2008, just before the Conference. The Bridges have remarkably contributed to the expansions for the economic, social, living, cultural exchanges etc. as a main artery between Honshu and Shikoku since the opening in April, 1988. We are considering promoting the effective usages of not only the Seto Ohashi Bridges but also other two expressways, because three expressways are expected to give more wide-ranging effects to the related areas in the future.

I sincerely thank New York State Bridge Authority, Sund & Baelte Holding A/S, other participatory countries and organizations concerned in Japan for the cooperation and assistance of the holding of the Conference.

Finally, I sincerely hope that the Conference would be helpful and fruitful to all attendees.

# Conference Site

Kagawa International Conference Hall

6F, Tower Site of Sunport  
Takamatsu Symbol Tower  
2-1 Sunport, Takamatsu,  
Kagawa Prefecture,  
760-0019 JAPAN  
Phone +81-87-825-5120  
Fax +81-87-825-5040



<http://www.symboltower.com/public/hall/en/>

## Aim of the Conference

### Aim of the ICSBOC

The aim of the ICSBOC is to exchange experiences on the maintenance and operation of cable supported bridges by the operators.

The 4<sup>th</sup> ICSBOC was held in Copenhagen, Denmark, in 2004, hosted by A/S Store Baelt and Oeresundsbro Konsortiet, and the 5<sup>th</sup> ICSBOC was held in New York, USA, in 2006, hosted by New York State Bridge Authority, respectively. The 6<sup>th</sup> ICSBOC is hosted by Honshu-Shikoku Bridge Expressway Co., Ltd.

### History of the ICSBOC

Years	Venues	No. of Countries
1991	New York (USA)	3
2000	New York (USA)	5
2002	Hyogo Prefecture (Japan)	6
2004	Copenhagen (Denmark)	7
2006	New York (USA)	8
2008	Kagawa Prefecture (Japan)	8

# Conference Schedule

Date	Time	Program	Remarks
May 22	10:00-	Registration	Kagawa International Conference Hall
	12:00-13:00	Lunch	
	13:00-13:30	Opening	
	13:30-15:10	Session 1 Maintenance Experiences of Cable Supported Bridges -1	
	15:10-15:30	Break	
	15:30-17:10	Session 2 Maintenance Experiences of Cable Supported Bridges -2	
	18:30-20:00	Reception	ALICE IN TAKAMATSU
May 23	09:00-10:15	Session 3 Fatigue	Kagawa International Conference Hall
	10:15-10:30	Break	
	10:30-11:45	Session 4 Monitoring	
	11:45-13:00	Lunch	
	13:00-15:20	Session 5 Maintenance of Main Cable	
	15:20-15:35	Break	
	15:35-16:50	Session 6 Innovative Topics for Maintenance	
	16:50-17:15	Closing	
May 24	09:30-13:00	Technical Tour	Seto Ohashi Bridges
	13:00-14:00	Lunch	

# Presentation Program

## Session 1: Maintenance Experiences of Cable Supported Bridges -1

May 22, 13:00 - 15:10

Chairperson: Ernst Laursen (Denmark)

Co-Chairperson: Kazuyoshi Sakai (HSBE)

- ◇ **A General Overview of Twenty Years Maintenance of Seto Ohashi Bridges:** Mamoru Nakamura, Yoshimi Hasegawa and Hirofumi Uemura, Honshu-Shikoku Bridge Expressway Co., Ltd., Japan
- ◇ **Maintenance History and Lessons from Two Scandinavian Suspension Bridges:** Matthew L. Bloomstine, COWI A/S, Denmark, Berni Bengtsson, Per Thunstedt, Swedish Road Administration, Sweden, and Jens Vejlbj Thomsen, Danish Road Directorate, Denmark
- ◇ **Rehabilitation of the Angostura Bridge over the Orinoco River Located in Ciudad Bolivar, Venezuela:** Natan Lustgarten, German Crespo, Lustgarten y Asociados C.A, Venezuela and Peter Sluszka, Ammann & Whitney, USA
- ◇ **Little Belt Suspension Bridge - Operation and Maintenance Experiences after Replacement of Expansion Joints and Installation of a Main Cable Dehumidification System:** Jens Vejlbj Thomsen, Danish Road Directorate, Niels Bitsch and Morten Zinck, COWI A/S, Denmark

## Session 2: Maintenance Experiences of Cable Supported Bridges -2

May 2, 15:30 - 17:10

Chairperson: Khaled M. Mahmoud (USA)

Co-Chairperson: Kazuyoshi Sakai (HSBE)

- ◇ **The Large Fixed Links in Denmark - Experience and Developments:** Leif J. Vincentsen, Sund & Baelt Holding A/S, Denmark
- ◇ **Present Condition and Tasks of Thirty Four Year Old - Kanmon Suspension Bridge:** Yasuo Fukunaga, Koutaro Kawaguchi, Sumitaka Kurino and Hisayuki Takama, West Nippon Expressway Co., Ltd., Japan
- ◇ **Maintenance of the Faro Bridges:** Erik Stoltzner, Danish Road Directorate,

Birit Buhr Jensen and Morten Zinck, COWI A/S, Denmark

- ◇ **Maintenance and Control of Railway Girders in Suspension Bridges (Seto-Ohashi Bridges) used as Road and Railway:** Hirohiko Mitsunaka, Kazuo Minato and Takeo Yokota, Shikoku Railway Company, Japan

## Session 3: Fatigue

May 23, 09:00 - 10:15

Chairperson: Ikuo Yamada (HSBE)

Co-Chairperson: Kazuyuki Ishihara (HSBE)

- ◇ **Fatigue Cracks in Railway Girders at Minami Bisan-Seto Bridge:** Hirohiko Mitsunaka, Hiroki Fukuoka and Kazunori Yamasaki, Shikoku Railway Company, Japan
- ◇ **Evaluation of the Structural Stability for Railway Girders of Seto-Ohashi Bridges Using Nondestructive Testing Systems:** Hirohiko Mitsunaka, Naoki Takase and Hiroki Iwamoto, Shikoku Railway Company, Japan
- ◇ **Great Belt - East Bridge, Reassessment of the Fatigue Capacity of the Orthotropic Steel Deck:** Ernst Laursen, A/S Storebaelt and Jakob Laigaard Jensen, COWI A/S, Denmark

## Session 4: Monitoring

May 23, 10:30 - 11:45

Chairperson: Leif J. Vincentsen (Denmark)

Co-Chairperson: Kazuyuki Ishihara (HSBE)

- ◇ **Full-Scale Measurements of Runyang Suspension Bridge during Typhoon based on SHMS:** Aiqun Li and Hao Wang, Southeast University, China
- ◇ **Development of a Super Remote Laser Sensing System for Monitoring of Cable-Supported Bridges:** Keita KUBOTA, Keisoku Research Consultant Co., Takeshi MIYASHITA, The Nagaoka University of Technology, Yojo FUJINO, The University of Tokyo, Noriyuki MIYAMOTO, Shuji UMEMOTO, Keisoku Research Consultant Co., and Hiroyasu SUEHIRO, Honshu-Shikoku Bridge Expressway Co., Ltd., Japan
- ◇ **Vibration Control for Cable Systems of Long-Span Bridges:** Kunihisa Mori, Ikuo Yamada and Shigeki Kusuhara, Honshu-Shikoku Bridges Expressway

Co., Ltd., Japan

## Session 5: Maintenance of Main Cable

May 23, 13:00 - 15:20

Chairperson: Mamoru Nakamura (HSBE)

Co-Chairperson: Susumu Fukunaga (HSBE)

- ◇ **Bear Mountain Bridge Update Cable Assessment:** William A. Moreau, New York State Bridge Authority and Peter Sluszka, Ammann & Whitney, USA
- ◇ **The Högakusten Suspension Bridge - Corrosion Protection of the Main Cables and Maintenance of Major Components:** Matthew L. Bloomstine, COWI A/S, Denmark, Staffan Gilliusson and Ove Andersson, Swedish Road Administration, Sweden
- ◇ **Operation of Dry Air Injection System on Honshu-Shikoku Suspension Bridges:** Tokunari Mohri, Yoshimi Hasegawa and Kazuyoshi Sakai, Honshu-Shikoku Bridge Expressway Co., Ltd., Japan
- ◇ **Safety Evaluation of a Suspension Bridge with Degraded Cables:** Imam Hossain, Ammann & Whitney, USA
- ◇ **State-of-the-Art in the Evaluation of the Remaining Strength of Degraded Bridge Cables:** Khaled M. Mahmoud, Bridge Engineering Association, USA

## Session 6: Innovative Topics for Maintenance

May 23, 15:35 - 16:50

Chairperson: Peter Sluszka (USA)

Co-Chairperson: Susumu Fukunaga (HSBE)

- ◇ **Measures against Snow Accretion on Suspension Bridges in Snowy Regions - Hakucho Bridge:** Hideaki Numata and Kozo Kitada, Ministry of Land, Infrastructure, Transport and Tourism, Hokkaido Regional Development Bureau, Japan
- ◇ **Design of Hardanger Suspension Bridge with Emphasis on Inspection and Maintenance:** Bjorn Isaksen, Norwegian Public Roads Administration, Alexander Kyte, Consulting Engineers Norconsult AS, Asbjorn Valen and Jan Ove Nygard, Norwegian Public Roads Administration, Norway
- ◇ **Seismic Performances on Strong Earthquakes and its Inspection Methods**

of the Kanmon Suspension Bridge: Yasuo Fukunaga, Takayuki Matsui, Sumitaka Kurino, West Nippon Expressway Co., Ltd., and Michiaki Sakate, Doyu Daichi Co., Ltd., Japan

## Social Program

### Opening

- ◇ Date: May 22, 13:00 - 13:30
- ◇ Place: Kagawa International Conference Hall  
6F, Tower Site of Sunport Takamatsu Symbol Tower
- ◇ Schedule:  
Greeting: Chikao Ito  
President, Honshu-Shikoku Bridge Expressway Co., Ltd.  
Sanukite Play: Michiyo Usuki

### Reception

- ◇ Date: May 22, 18:30 - 20:00
- ◇ Place: Restaurant "ALICE IN TAKAMATSU"  
30F, Tower Site of Sunport Takamatsu Symbol Tower

### Closing

- ◇ Date: May 23, 16:50 - 17:15
- ◇ Place: Kagawa International Conference Hall  
6F, Tower Site of Sunport Takamatsu Symbol Tower
- ◇ Schedule:  
Summary: Makoto Kitagawa  
Managing Director,  
Honshu-Shikoku Bridge Expressway Co., Ltd.  
Address by Organizer for the Next Conference:  
Zhou Haitao, Chief Engineer,  
Ministry of Communications, P. R. China

Ou Qingbao, Vice General Manager,  
Jiangsu Ruyang Bridge Development Co., Ltd.

## Technical Tour

- ◇ Date: May 24, 09:30 – 15:00
- ◇ Tour: Participants can experience the construction and maintenance technologies of the Seto-Ohashi Bridges which marked the 20<sup>th</sup> anniversary just before the Conference.
- ◇ Meeting Place: Entrance of ANA Hotel CLEMENT Takamatsu
  - ※ Participants are requested to meet at the place by 09:15.
- ◇ Schedule:
  - 09:30 Depart from ANA Hotel CLEMENT Takamatsu
  - 10:30 Arrive at Yoshima Parking Area of Seto-Chuo Expressway
    - Visit Kita Bisan-Seto Bridge
    - Anchorage - Girder - Tower
  - 13:00 Lunch
  - 14:00 Depart from Yoshima Parking Area
  - 15:00 Arrive at
    - ANA Hotel CLEMENT Takamatsu or JR Okayama Station
- ◇ Dismissing Place: Entrance of ANA Hotel CLEMENT Takamatsu or JR Okayama Station
  - ※ The registration of the Tour is required in advance.



## Accompany Tour

- ◇ Date: May 22, 13:00 – 17:00

- ◇ Tour: Participants can join the tour to visit sightseeing spots around Takamatsu.
- ◇ Meeting Place: Entrance of ANA Hotel CLEMENT Takamatsu
  - ※ Participants are requested to meet at the place by 12:45.
- ◇ Schedule:
  - 13:00 Depart from ANA Hotel CLEMENT Takamatsu
  - 13:30 Arrive at Ritsurin Park
  - 15:00 Depart from Ritsurin Park
  - 15:30 Arrive at Yashima
  - 16:30 Depart from Yashima
  - 17:00 Arrive at ANA Hotel CLEMENT Takamatsu
- ◇ Dismissing Place: Entrance of ANA Hotel CLEMENT Takamatsu
  - ※ The registration of the Tour is required in advance.
  
- ◇ Date: May 23, 09:00 – 17:00
- ◇ Tour: Participants can take part in the tour for Tokushima - Naruto area in Shikoku.
- ◇ Meeting Place: Entrance of ANA Hotel CLEMENT Takamatsu
  - ※ Participants are requested to meet at the place by 08:45.
- ◇ Schedule:
  - 09:00 Depart from ANA Hotel CLEMENT Takamatsu
  - 10:00 Arrive at Naruto Park
  - 11:50 Depart from Naruto Park
  - 12:00 Arrive at Otsuka Museum of Art
  - 16:00 Depart from Otsuka Museum of Art
  - 17:00 Arrive at ANA Hotel CLEMENT Takamatsu
- ◇ Dismissing Place: Entrance of ANA Hotel CLEMENT Takamatsu
  - ※ The registration of the Tour is required in advance.

## Conference Information

### Official Languages

The official Languages will be English and Japanese.  
 Simultaneous interpretation will be provided during the Opening, Closing and Presentations.

## Lunch

Lunch tickets for 4,000 JPY (eight 500 JPY tickets) are provided to each participant during registering the Conference.

Meals on Thursday May 22<sup>nd</sup> to Saturday May 24<sup>th</sup> are served at any restaurant in “Maritime Plaza” adjacent to “Kagawa International Conference Hall”, by exchanging the tickets. If the price of meal is less than the face value of the tickets, the change can not be given. Meal on Saturday May 24<sup>th</sup> is served during the Technical Tour, if participants take part in the Tour.

## Drinking Service

Drinking service is supplied for participants in the entrance lobby of the Conference hall. Feel free to relax there during the breaks between the sessions.

## Contact for Inquires

Secretariat of the 6th ICSBOC

Business Room, Kagawa International Conference Hall

Masaaki Kitaguchi, Masahiro Nishitani

# Conference Site Information

## Conference Site

Kagawa International Conference Hall  
6F, Tower Site of Sunport Takamatsu Symbol Tower  
2-1 Sunport, Takamatsu, Kagawa Prefecture,  
760-0019 JAPAN  
Phone +81-87-825-5120  
Fax +81-87-825-50409  
<http://www.symboltower.com/public/hall/en/>

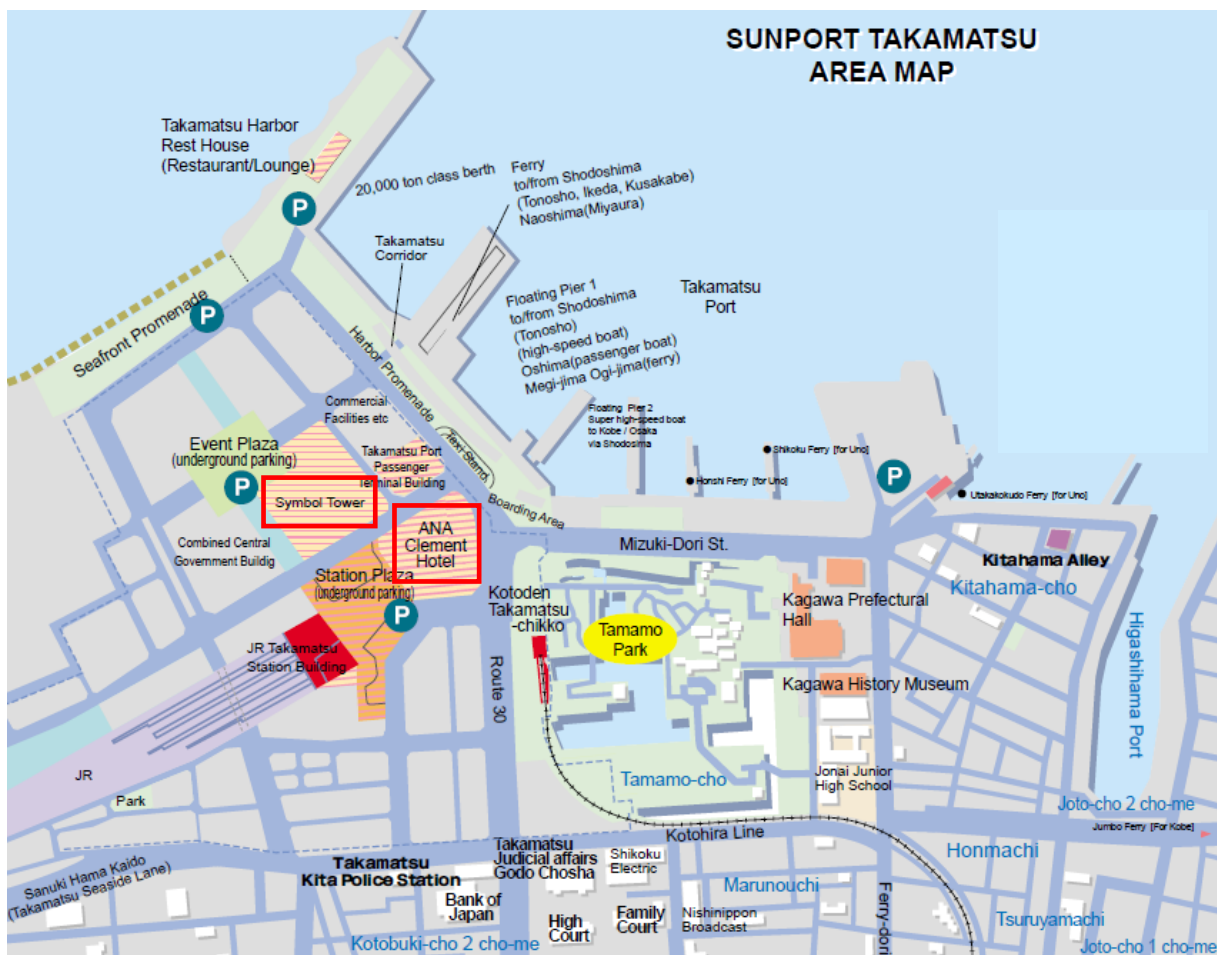


## Access

Accessing Sunport Takamatsu is as follows,

- From JR Takamatsu Station: within Sunport Takamatsu
- From Kotoden Takamatsu Chikko Station: approx. 2 min. walk
- From Takamatsu Port: within Sunport Takamatsu
- From Takamatsu Central Interchange: approx. 20 min by car
- From Takamatsu Nishi Interchange: approx. 20 min by car
- From Takamatsu Airport: About 40 minutes by Kotoden Takamatsu airport limousine bus bound for JR Takamatsu station

## Sunport Takamatsu Area Map



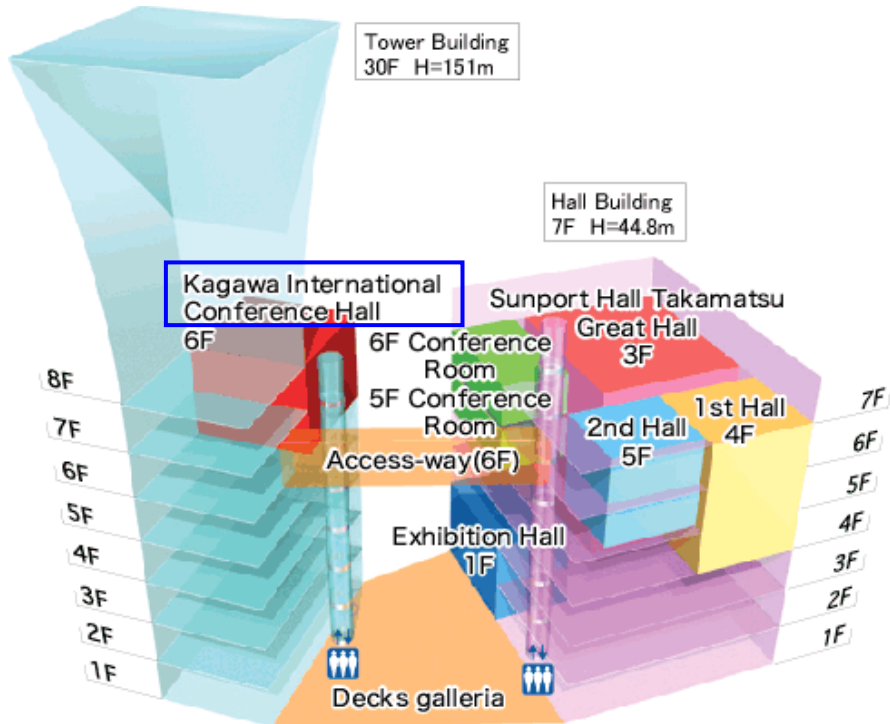
The following are useful web site.

<http://www.symboltower.com/public/hall/en/>

[http://www.takamatsu.or.jp/english/eng\\_support/eng\\_support\\_f.html](http://www.takamatsu.or.jp/english/eng_support/eng_support_f.html)

# Conference Site Information

## Convention Facilities in Symbol Tower



## Floor Plan of the Kagawa International Conference Hall

