



A Look Inside CIMAC

CIMAC, the International Council on Combustion Engines, is a worldwide organization in the field of large combustion engines, gas engines and gas turbines. CIMAC offers its members — national member organizations as well as corporate members (direct company members) — a variety of services, including lively working groups investigating special topics, a technical paper database with more than 2000 highly professional papers and yearly CIMAC events. CIMAC events, which are managed by the members of the national organizations or by the CIMAC Central Secretariat, take the form of panel discussions of topics relevant to the engine industry and, every three years, a CIMAC Congress at which over 180 technical papers are presented to 600 to 800 participants. 2007 is a Congress year and preparations are presently under way for the 25th CIMAC Congress, which will be held in May in Vienna.

We would be pleased to welcome you at the CIMAC Congress.

25th CIMAC World Congress on Combustion Engine Technology for

**Ship Propulsion
Power Generation
Rail Traction**

May 21–24, 2007 | Vienna — Austria

www.cimac.com

Diesel & Gas Turbine Worldwide Special Report March 2007

Proud to power the U.S. Navy and U.S. Coast Guard

**FAIRBANKS
MORSE
ENGINE**

an EnPro Industries company



Freedom (LCS 1)



USNS Lewis and Clark (T-AKE 1) Class



USS Makin Island (LHD 8)



USS San Antonio (LPD 17) Class

CONFIDENTIAL

What makes Fairbanks Morse Engine the **PREFERRED** supplier of medium speed diesel engines?

- **EXPERIENCE** – Fairbanks Morse Engine has been providing marine propulsion and ship service diesel generators to the U.S. Navy and U.S. Coast Guard for over 70 years.
- **RELIABILITY** – Fairbanks Morse engines operate as effectively and efficiently today as when they were first put into service.
- **DURABILITY** – Fairbanks Morse Engine's rigorous testing assures performance in the most severe conditions.

75% of U.S. Navy surface ship programs have Fairbanks Morse engines on board.



Shock Test

EXPERIENCE

- Freedom (LCS 1)
- USS San Antonio (LPD 17) Class
- USS Wasp (LHD 1) Class
- USS Makin Island (LHD 8)
- USS Whidbey Island (LSD 41/49) Class
- USNS Lewis and Clark (T-AKE 1) Class
- USNS Henry J Kaiser (T-AO 187) Class
- USNS Bob Hope (T-AKR 300) Class
- USCG Polar Class Icebreakers
- USCG High Endurance Cutters
- USCG Medium Endurance Cutters
- USS Ohio (SSBN 726) Class
- USS Seawolf (SSN 21) Class
- USS Los Angeles (SSN 688) Class

POWER*Solutions*
Our Business For Over A Century.

www.fairbanksmorse.com

SEE DIRECTLINK @ WWW.DIESELGASTURBINE.COM

What's Inside

President's Message3

CIMAC's History4

Vienna, 20076

Working Groups10

CIMAC Central Secretariat

c/o VDMA e. V.

Lyoner Strasse 18

60528 Frankfurt Germany

Tel: ++49 69 6603-1567

Fax: ++49 69 6603-1566

E-mail: CIMAC@VDMA.ORG

Web: www.cimac.com



Publication Headquarters

20855 Watertown Road

Waukesha, WI 53186-1873, U.S.A.

Tel: +1-262-754-4100

Fax: +1-262-754-4175

Publisher & Editor: Mark McNeely

E-mail: mmcneely@dieelpub.com

Web: www.dieselgasturbine.com

President's Message



Matti Kleimola

President of CIMAC

CIMAC is a worldwide organization in the field of large combustion engines, gas engines and gas turbines. Since its foundation in 1951 in Paris, CIMAC is dedicated to promote the exchange of scientific and technical information, to improve understanding between engine manufacturers and users and between manufacturers and suppliers, and to issue publications in the form of recommendations and position papers via its various Working Groups.

Presently CIMAC has 10 active Working Groups dealing with specific topics ranging from exhaust emissions control, fuels and marine lubricants, engine specification, classification and users' aspects to turbocharger efficiency, crankshaft rules, electronics and software systems, auxiliary systems design, engine room safety and classification. The CIMAC Working Group chairmen warmly welcome interested

companies to join CIMAC and become engaged in the work of the CIMAC Working Groups.

CIMAC has about 380 members worldwide. Most are organized in National Member Associations (NMAs) or National Member Groups (NMGs), but we also have 19 Corporate Members in countries where no national CIMAC organization exists.

To its members CIMAC offers a variety of services, e. g., free access to the CIMAC Technical Paper Database comprising nearly 2000 high-quality Congress papers and CIMAC recommendations in a fully searchable database. Visit our website www.cimac.com to learn more about us.

Every two to three years a CIMAC Congress is organized by one of the CIMAC National Member Associations. After the last CIMAC Congress in Kyoto in 2004 we are now busy preparing the forthcoming 25th CIMAC Congress in Vienna, Austria, taking place from May 21–24, 2007.

Widely recognized as the most technically acclaimed event in the field of Marine, Power and Rail applications, the CIMAC Congress 2007 is focusing on all aspects of energy conversion and engine operation, including product research and development, performance improvement and sustainability issues. The technical areas covered are categorized in 14 CIMAC sessions on diesel engines, gas engines and gas turbines. The technical program will offer high-quality technical papers in altogether 44 (sub-) sessions, as well as presentations in three poster sessions.

I would be pleased to welcome you at the CIMAC Congress in Vienna in May. ☺



CIMAC's History

Editor's Note: *More detailed information on CIMAC's origin and history is available in the organization's publication titled, "The First Fifty Years: CIMAC 1951-2001."*

Digging out the history of CIMAC — beginning with the initial idea and detailing events that most of today's participants will probably be unaware of — is a task worthy of recognition. So far no one has been assigned the job of compiling a complete record, because a true recollection of the astonishing vitality of such events cannot be drawn from the papers, only from personal involvement." So wrote Siegfried Meurer, one of the pioneers of diesel combustion in his introduction to the first "History of CIMAC" in 1972.

How It Began

WWII was over. The world's nations were busy putting their houses in order and repairing the damage left in its wake. Energy was in great demand, and the internal combustion engine was seen as being instrumental in meeting it. The technology, while 50 years old, was still young.

During the war years, economics had been sidelined by the urgent need to develop and produce. Little was known of neighboring countries' efforts, what they were doing and why. Now, with the mountains of problems unresolved, it was time to cooperate, compare experience, discuss problems and share insights into the future of the industry.

Milestone Congresses

Paris 1951: The first congress in the history of CIMAC was organized by "Le

Syndicat des Constructeurs de Moteurs à Combustion Interne" under its president Paul J. Tharlet, who subsequently became the first CIMAC president. Eighty-nine papers were accepted by the technical commission. In all, 505 delegates from 15 countries attended an event that lasted nearly two weeks.

Zurich 1957: It is generally accepted that Zurich was where CIMAC finally took shape. With Japan, which had joined in 1953, and the United States, which joined that year, CIMAC could now count 13 member states. Zurich was the first congress to give gas turbines their own sessions, during which eight papers were presented. The proceedings record the never-ending competition between gas turbines and reciprocating engines in terms of their reliability, fuel economy, installation and maintenance costs.

Paris 1983: Back to CIMAC's roots of 1951. The first CIMAC Exhibition. How environmental factors affect design and development; synthetic fuels for gas turbines. The gala dinner in Versailles. First CIMAC Gold Medals are awarded.

The 1990s Bring Change

Several important changes to the CIMAC organization came about in the 1990s and continue to this day. Among these changes was the formation of "National Member Associations" (NMA). These were believed to be able to attract a much wider group of interested parties, including scientific institutions, than the "National Manufacturers Associations" of before.

Giving the Working Groups more weight and influence. Encouraging them to present their work in dedicated sessions at the congresses.

Empowering the Board by giving it tasks of a clearly executive character. Establishing the system of vice presidents, each responsible for a specific task.

Opening the organization up to the User. This has taken CIMAC more than 40 years, during which time it was often lamented that users were absent. As Paul Tharlet commented in 1951, "We felt on our Permanent Committee that the user was inadequately represented."

Relations with the trade press were greatly intensified, gaining space in several journals on a regular basis by working more closely with the editors. Working Group Reports and general information on CIMAC and its activities are now regularly disseminated to the public.

Sponsorships

Today, CIMAC as a not-for-profit association could not survive without sponsors. Contributions from the NMAs cover only some of the costs of the slim Central Secretariat.

The risk involved in financing a CIMAC Congress is borne by the hosting NMA, which is aware as soon as planning begins that the costs incurred by the congress cannot and will not be covered by the fees paid by the delegates. In consequence, it has become a tradition for members to support CIMAC by making a significant contribution to the organization and running of the congress.

The Working Groups

It is difficult today to determine just when the first Working Groups (WGs) were established, but it must have been just before or at the time of the Zurich Congress. The first publication to come from a Working Group was the

"Recommendations for Diesel Engine Acceptance Tests" in 1961.

It has long been a characteristic of CIMAC Congresses to report on and discuss new developments, work in progress and future development needs. Working Groups have been implemented with the aim of promoting scientific work, undertaken by experts, on specific topics in the time between congresses. As time has passed, a treasure trove of expertise has been accumulated by the WGs — expertise which often has resulted in the publication of CIMAC Recommendations.

It is a fact, too, that on behalf of CIMAC, the Working Groups have succeeded in developing a user language that, for the most part, has been accepted worldwide.

The CIMAC Circles

In order to keep CIMAC in the public eye in the years between congresses, the CIMAC Executive Board instituted the CIMAC Circle. It was intended

to hold one such event in each intervening year, but the CIMAC Circle soon gathered a momentum all its own. Since 1996, which the first one was held in Hamburg, five CIMAC Circles have taken place. In addition, local CIMAC Circles and CIMAC Sessions have been held around the world. Many participants attend and the trade press is always well represented.

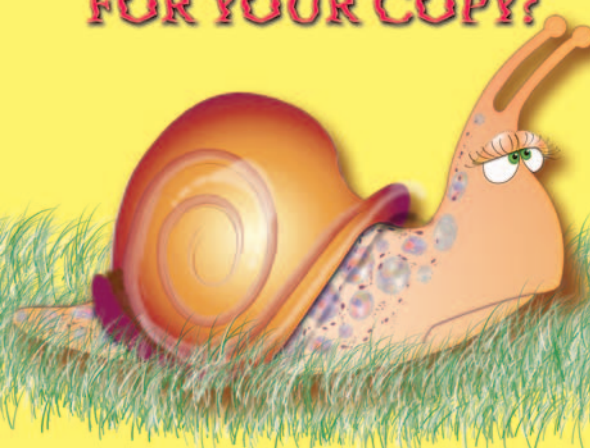
A regular feature of the SMM, Shipbuilding, Machinery & Marine Technology trade fair held every two years in Hamburg, CIMAC Circles have attracted growing interest with each new event. This past year was no exception. The CIMAC Circle held at SMM 2006 on Thursday, 28th September, set a new attendance record for this popular biennial event. More than 300 visitors to SMM 2006 crowded into the Copenhagen room on the exhibition site to hear and take part in a lively CIMAC discussion on "Next generation marine diesel engines — Visions for the next decade."

Outlook

To keep abreast of the times, CIMAC will have to keep on adapting. The website is only the first step; members must also be able to view the proceedings on CD-ROMs and on the Internet. CIMAC also has to attract younger technologists. Students and post graduates must be integrated into CIMAC life. Pushing the Working Groups and furthering dialogues with users will help to ensure that CIMAC retains its status as: The World's Scientific Society for Diesel and Gas Turbine Propulsion, Power Generation and Traction.

Today CIMAC is in the information business because technology is moving faster than ever. To stand still in the engine business and to continue to provide the same product is to die a not too slow death. Continual reassessment of products and firm decision-taking are necessary for success. Information is required to help us do this. CIMAC is able to provide more of that independent information. This is our strength. ☺

**TIRED OF WAITING
FOR YOUR COPY?**




Start or change your subscription to
our new **DIGITAL VERSION** of

**DIESEL & GAS TURBINE
WORLDWIDE**
The Marine and Stationary Power Authority

and receive the issue as soon as it is published!



To subscribe go to
www.diesलगasturbine.com
and click on **Subscribe/Renew**

 **Wissenschaftlich-
Technisches
Zentrum**

für Motoren- und Maschinenforschung Roßlau gGmbH

Combustion Engines

- Research
- Development
- Test
- Design
- Project Planning
- Certification
- Service
- Consulting

Karl-Liebnecht-Str. 38
06862 Roßlau, Germany
Telefon: +49 (34901) 883 - 0
Fax: +49 (34901) 883-120
E-Mail: info@wtz.de
Internet: www.wtz.de

SEE DIRECTLINK @ WWW.DIESELGASTURBINE.COM



Congress

Vienna

07

CIMAC and the Austrian National CIMAC Committee are delighted to invite you to the 25th CIMAC World Congress to be held in Vienna 21st–24th May 2007. The Congress is being held at the Vienna Hofburg, one of the most beautiful historical congress venues in the world. CIMAC has also chosen Austria for its Silver Jubilee event, which will be celebrated at the end of the Congress.

The Congress is devoted to the presentation of papers in the fields of marine, power generation and locomotive engine engineering, covering state-of-the-art technologies as well as the application of such engines. Moreover, the event provides the unique opportunity to meet colleagues and customers from the industry around the world.

Vienna promises to stand out as one of the most successful CIMAC conferences. More than 270 papers have been submitted. This new record in interest guarantees the selection of papers of only the highest quality and the prospect of it, therefore, being an exceptionally profitable meeting.

Three panel discussions with outstanding keynote speakers will provide a stimulating forum for the exchange of

ideas and an informed review of developments to be expected in the future.

An informative and comprehensive exhibition with integrated poster sessions will complement the Congress presentations. It will offer not only an overview of the latest product developments, but also create a discussion platform for exhibitors and Congress participants.

Social events enabling you and your accompanying partner to experience Austrian culture and gain memorable impressions of Vienna will round off your stay in this beautiful city.

Technical Program

The Technical Program of the 25th CIMAC Congress will deal with diesel engines, gas engines and gas turbines, their components and systems, covering marine, stationary and rail applications, with a special focus on the role of engine users. The Technical Program will be developed in the Technical Sessions and the Poster Sessions.

The high level Technical Sessions together with panels of technicians, top managers and users will enhance the communication to evaluate the impacts on the internal combustion engine industry. (See *Table of Topics*.)

continued on page 8

Session 1:
Product Development —
Diesel Engines

Session 2:
Fundamental Engineering —
Piston Engines (Diesel & Gas)

Session 3:
Environment, Fuel &
Combustion — Diesel Engines

Session 4:
Tribology — Diesel Engines

Session 5:
Component & Maintenance
Technology — Diesel Engines

Session 6:
System Integration —
Diesel Engines

Session 7:
Product Development —
Gas Engines

Session 8:
Component & Maintenance
Technology — Gas Engines

Session 9:
Turbochargers

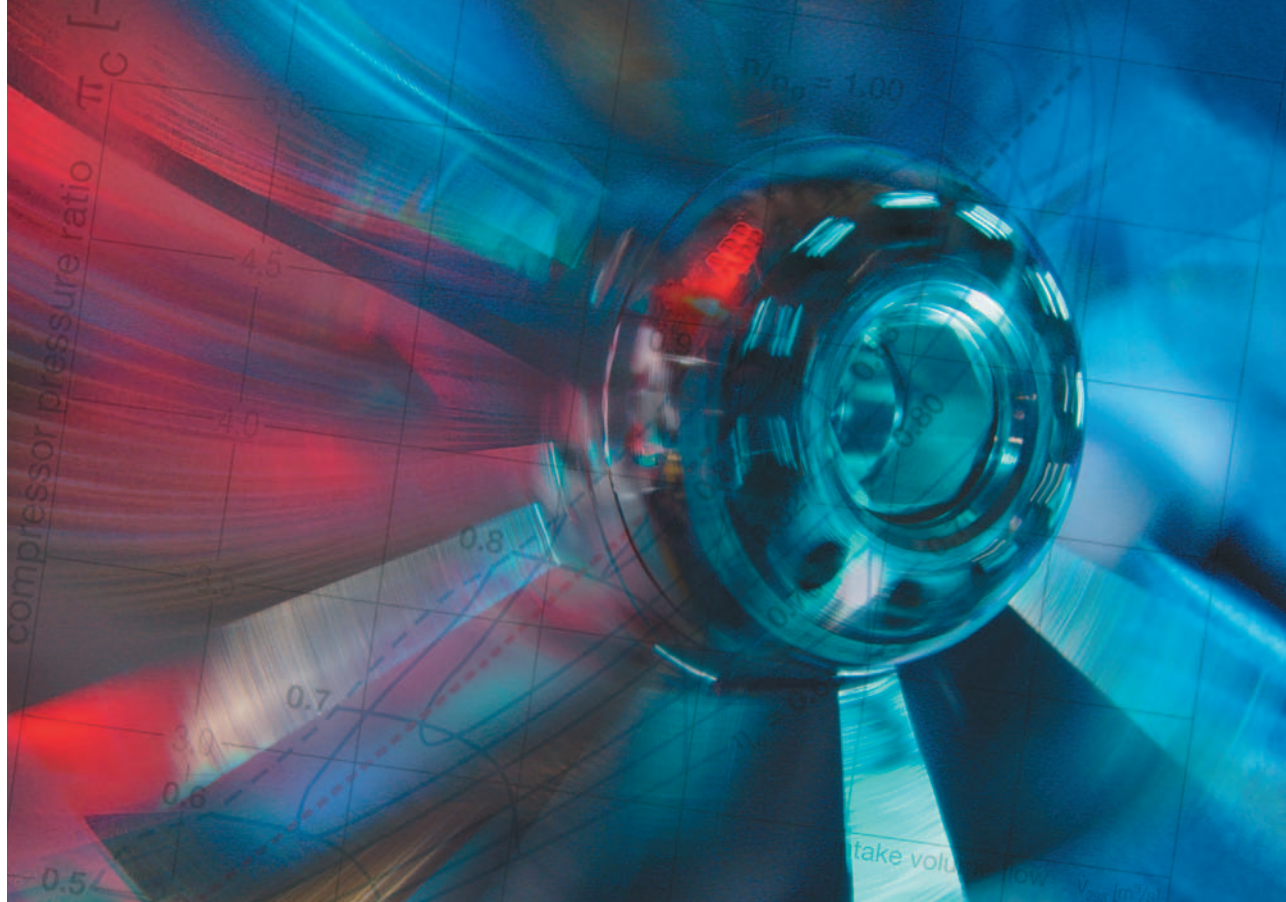
Session 10:
Product Development &
Fundamental Engineering —
Gas Turbines

Session 11:
Environment, Fuel &
Combustion — Gas Turbines

Session 12:
Integrated Systems —
Piston Engines & Gas Turbines

Session 13:
Users' Aspects —
Marine Applications

Session 14:
Users' Aspects — Land-based
Applications (Power Generation,
CHP, Oil & Gas, Rail, etc.)



Peak performance for peak performers

Reach the peak – through our performance

ABB is the world leader in turbocharging diesel and gas engines in the 500 kW plus power range. Worldwide, more than 175,000 ABB turbochargers are in operation – on ships, in power stations and gensets, on diesel locomotives and in large off-highway trucks. A global network of more than 80 service stations ensures close proximity to our customers and fast, top-quality service around the clock. For further information please call your nearest service station or contact: ABB Turbo Systems Ltd, Baden/Switzerland.

SEE DIRECTLINK @ WWW.DIESELGASTURBINE.COM

www.abb.com/turbocharging

ABB

Also, on Tuesday, Wednesday and Thursday, more than 45 interesting Papers will be presented in the poster area located in the exhibition area. Opening time is from 10:00 to 16:00. Make use of this opportunity to discuss your topics with the authors directly and without any time pressure. The authors will be awaiting you for explanation and discussion in their booths.

Exhibition

Together with the congress, a technical exhibition will be held in the Hofburg Congress Center on the ground floor. The exhibition occupies about 700 m² of floorage. Entrance to the exhibition is free of charge for all delegates, and coffee/tea will be served in the exhibition area during all coffee breaks. Integrated in the exhibition is the CIMAC technical poster session.

Please refer to the following webpage to gather further information on the exhibition and registration: www.aims-international.com/cimac2007/

Tours & Open House

A variety of technical visits to Austrian manufacturers and institutions linked with the visit of sights will be offered to all participants and accompanying persons on Friday, 25th

May 2007, just after the end of the congress. Note: For each of the following tours a minimum number of 50 participants is required.

Due to the limited number of participants the registration will be done on "first come, first served" basis. Tours include: Tour A – Tour Vienna: Hoerbiger Ventilwerke and Siemens Transportation; Tour B – Tour Graz: AVL List and LEC Graz; and Tour C – Tour St. Florian: Magna Powertrain and Miba Gleitlager

Also on Friday, 25th May 2007, the following companies offer an Open House and the opportunity for a company visit:

- GE Jenbacher GmbH & Co. OHG, Achenseestrasse 1–3; 6200 Jenbach, Tyrol
- Geislinger GmbH, Hallwanger Landesstrasse 3, 5300 Hallwang, Salzburg
- Miba Gleitlager GmbH, Dr. Mitterbauerstrasse 3–5, 4663 Laakirchen, Upper Austria
- Magna Powertrain Engineering Center Steyr, Steyrer Strasse 32, 4300 St. Valentin, Upper Austria

Those congress participants who are willing to use the opportunity of the Open House, are kindly asked to organize travel to and from the companies by themselves, but there is no need to make a reservation.

A varied choice of optional tours and activities for accompanying persons have been developed to provide a long-lasting impression of Austria. All tours and activities will be accompanied by an English-speaking guide and are based on a minimum number of 20 participants. All tours start and end at the Hofburg Congress Center.

Venue

The Congress will take place at the Hofburg Congress Center located in Vienna's city center. The address is Hofburg Congress Center, Heldenplatz, 1014 Vienne

The official language of the Congress is English and all presentations are to be made in English. There is no translation service, but one of the chairmen at each Congress Session is German/Austrian native speaker. At the post-Congress tours and accompanying persons tour, there are guides speaking both English and Germany.

The Congress Proceedings are included in the Congress registration fee.

Lunch after the Opening Ceremony on Monday, 21st May is included in all delegates' and accompanying persons' fees. Lunches from Tuesday, 22nd May to Thursday, 24th May are included in the delegate registration fee, but not in the accompany persons' fee. ☺

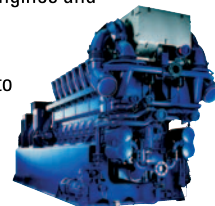
DEUTZ POWER SYSTEMS

concentrated energy



Our world is full of energy – and we understand how to use it. For we are one of the largest independent producers of gas engines and equipment worldwide.

With our complete power spectrum from 180 to 4,000 kW, we offer you tailor-made, efficient, and economical equipment for converting fossil and non-fossil fuels.



You can, of course, also make use of our know-how in calculating feasibility studies, planning facilities, and implementing entire projects.

And so when your goal is to make the most of your energy, talk to the best.



Diesel Injection Systems



OMT Officine Meccaniche Torino S.p.A.

Uffici/Offices: Via Ferrero, 67/a

Stabilimento/Factory: Via Di Vittorio, 25/a • 10090 Cascine Vica • Rivoli (TO) • Italy

Tel./Phone +39 011 950 53 34 • Fax +39 011 957 54 74

web site: www.omt-torino.com • e-mail: omt@omt-torino.com

SEE DIRECTLINK @ WWW.DIESELGASTURBINE.COM



CIMAC WORKING GROUPS

Editor's Note: *Aside from the periodic CIMAC Congresses, which provide the opportunity for a very high level of technical presentations, the organization's "backbone" is its various Working Groups. Established during CIMAC's infancy, the CIMAC Working Groups have evolved to address the requirements of the large engine community. The Exhaust Emission Control Working Group, for example, helps define and prepare recommendations that can be used by international regulatory agencies and the engine end users. There are 10 active working groups within CIMAC that cover the major aspects of the engine themselves, as well as their ultimate application.*

The following is a current update of each group's activities and other matters of relevance.

Working Group 2 (WG2) Classification Societies – Diesel

**Chairman, Kjeld Hansen,
MAN Diesel A/S**

CIMAC WG2 represents engine builders and engine designers worldwide. At present the group has 10 members. In addition, representatives of the classification societies participate in meetings to synchronize work with their internal activities through the IACS Working Party on Machinery, a group within the International Association of Classification Societies. As a coordinating working group within CIMAC, WG2 is recognized as a negotiating body with contact to the IACS Working Party on Machinery.

Designing new class rules and adjustment of existing rules to bring them into line with the state of the art for diesel engines and related systems, the group contributes to the development of stan-

dardized IACS Unified Rules and unified requirements for the benefit of the marine industry. Coordinating input from other CIMAC Working Groups with IACS WP on Machinery. WG2 constituents consist of classification societies, engine manufacturers and companies from the marine industry worldwide, engine builders associations, international and national authoritative bodies, and shipyards.

Group meetings are two to three times a year, hosted in turn by the companies of the different members. There are also one to two meetings per year between IACS WP on Machinery and CIMAC WG2.

Ongoing subjects include: rules for type approval testing of two-stroke diesel engines; rules for relief valves for diesel engine crankcase and other volumes in engines; overhaul interval of bearings in two-stroke diesel engines; rules for dual fuel engines; rules for testing the new generation of E-engines (camshaftless engines); and safety provisions at test beds prior to testing of diesel engines. ⚙️

Working Group 4 (WG4) Crankshaft Rules

**Chairman, Matti Savolainen,
Wärtsilä Corporation**

WG4 presently has about 20 members, drawn from engine builders, component suppliers and classification societies. The group's aim is to create a set of rules for the dimensioning of crankshafts, taking into consideration the possibilities offered by the much greater computational power now available.

"The first group meeting in 2007 is planned to be held during the CIMAC Congress 2007 in Vienna," said Matti

Savolainen, chairman of WG4. "There are several issues which the group has to focus on due to recent development in many areas and, therefore, an update of the dimensioning rules to a modern level is needed."

WG4 has prepared a revision of the current UR M53 document, which dates back to 1986. This revision is currently being reviewed by IACS. CIMAC has submitted a set of documents to IACS describing the reasons for the proposed modifications.

With the proposal for the modified Unified Rule M53 under review, the Working Group has focused its attention on a modern approach to defining the dimensions of crankshafts.

The current set of rules takes an analytical approach to determination of the crankshaft strength and relies on formulae for stress concentration factors derived from experimental results. The first step in the creation of a new set of rules will be to substitute analytical formulae for stress concentration factors (SCF) by FEM analysis. Afterwards, modern, computer-based methods for simulating crankshaft loading will be introduced. Other subjects of discussion are the introduction of multi-axial fatigue criteria for judging safety from fatigue failure, as well as the method of judging the effect of surface treatment at the fillet radii.

"All the above is aiming for higher accuracy in dimensioning. That would lead to lighter, smaller and durable crankshaft in engines," Savolainen noted. "Naturally, the need comes from the fact that there is always a call for better overall efficiency in terms of fuel consumption and emissions to the air." ⚙️

continued on page 12

Energy. It's in our nature.

Cogeneration for your greenhouse with the option of CO₂ fertilization.

The benefits of power generation go well beyond heating and lighting. At GE, our engines are fueling life itself. We use the carbon dioxide our engines create to fertilize plants housed in greenhouses – supporting nature, while still powering your home.

If you'd like to know more about just how innovative our gas engines are, please visit www.gejenbacher.com



GE imagination at work

Working Group 5 (WG5) **Exhaust Emission Control**

Chairman, Göran Hellén,
Wärtsilä Corporation

WG5 has 39 members from 11 countries and its purpose is to discuss — in an international, cross-industry forum — the implications arising from exhaust emissions as applied to the marine industry and land-based engine power plants, and to contribute suggestions.

The group's constituents consist of representatives from the engine builders, research institutes, equipment suppliers, classification societies, shipowners and oil companies. Meetings are held several times a year, being hosted in turn by the different members' companies.

Ongoing subjects of discussion include a review of marine regulatory developments: CARB, EPA, EU, IMO, River Rhine, World Bank, etc.

Current considerations of WG5 include the cooperation with WG10 "Engine Users," targeted at a CIMAC Recommendation paper: "Classification of existing marine engines (not regulated by IMO Marpol 73/78 Annex VI) on exhaust emissions basis." The activity was proposed by WG10.

There is also the preparation of a CIMAC Recommendation paper: "Wash water discharge criteria" for marine SO_x scrubbers. This activity is currently on hold because the guidelines for "Wash water discharge criteria" are currently subject for discussions within a corresponding group established by IMO.

And preparation of an "Emission Abatement Technology Matrix" is under way, which is a quick reference snapshot of where we are in terms of exhaust emissions control technologies (applicability, advantage/disadvantage, pros/cons, percent reduction, etc). The first draft was scheduled to be ready by February 2007, with the final paper ready in mid-2007.

WG5 also maintains relationships with other CIMAC Working Groups in various ways. For example, the overlap in scope of work between WG5 and the new WG17 Gas Engines has been agreed upon. Regulatory developments of gas engine emissions are to be covered by WG5, while the technical gas engine emission

issues are to be covered by WG17. Close cooperation between the groups has been established on gas engine emission issues.

Finally, there is pending cooperation with WG10 Engine Users on the classification of existing ships on an exhaust emissions basis. ●

Working Group 7 (WG7) **Heavy Fuel**

Chairman, Kjeld Aabo,
MAN Diesel A/S

WG7 consists of many different specialists in this field representing 14 countries in all. The CIMAC HFO Working Group Fuel Recommendation issued by the CIMAC HFO WG in 1982 was used as a guide for both the BI (BS-MA 100) and the ISO 8217 standards, both of which were introduced after the first CIMAC recommendation.

Today, the ISO and CIMAC fuel groups work closely together to ensure consistency in the standards and recommendations introduced to the market and to unite the workforce.

CIMAC has the advantage of being able to mobilize recommendations at short notice, which makes it highly flexible. Past papers, such as "Recommendations regarding fuel quality for diesel engines," are available online and can be updated whenever needed to adapt to changes in the market, such as new emission regulations.

The group's constituents consist of representatives from oil companies, engine builders, shipowners, classification societies, fuel cleaning equipment and research institutions.

Ongoing subjects include the latest edition of the recommendations regarding fuel requirements for diesel engines — Paper No. 21 (available on the website). This edition of the Fuel Requirements introduces several important changes, including: reduction of the number of residual fuel grades from 13 to 10; change of temperature for viscosity measurement from 100°C to 50°C and, therefore, revision of grade nominations; incorporation of the future lower global limits for sulfur in emission control areas; reduction of maximum water content to 0.5% V/V; revision of minimum viscosi-

ty limit for A 30 fuel grade; prohibition of the inclusion of used lubricating oil in marine fuel, controlled by including the limits for elements fingerprinting the presence of used lubricating oil.

The WG7 is also working on a new edition of the Recommendations on the Design of Heavy Fuel Treatment Plants. The recommendations regarding the Design of Heavy Fuel Oil Treatment Plants for Diesel Engines is also undergoing some major changes. The main items being: definition of the fuel treatment system fuel properties; layout of the total treatment and system tanks; fuel cleaning and conditioning system; sludge treatment system; fuel treatment (additives); and sampling.

Other subjects that WG7 is working on include low sulfur fuel, combustion properties and grade rationalizing. WG7 maintains relationships with other CIMAC Working Groups including WG8 Marine Lubricants and WG10 Engine Users. ●

Working Group 8 (WG8) **Marine Lubricants**

Chairman, Dr. Holger Gehring,
MAN Diesel SE

CIMAC Working Group 8 Marine Lubricants is a truly global team, with members from Japan, the U.S.A. and all over Europe. Experts from all relevant disciplines — engine and equipment manufacturers, oil and additive suppliers, classification societies and scientific institutions — meet twice a year. Members work to promulgate know-how on marine lubrication by producing guidelines and recommendations dedicated to furthering the industry's understanding of this important subject. WG8 has formed several subgroups that meet more frequently and prepare issues to be discussed and endorsed by the Working Group during its regular meetings.

WG8 concerns itself with reliability and availability, because these are of paramount importance to all users of internal combustion engines. Inherent engine design reliability must be complemented by an adequate periphery, including the use of appropriate lubricants and fuels.

The first proof of WG8's efficiency was provided by CIMAC Recommendations 13 and 15, which deal with the lubrication of medium-speed and two-stroke low-speed diesel engines. The recognition this received motivates the group to continue its work on further industry issues.

The WG has now undertaken to complete several additional documents. Their titles and CIMAC Recommendation numbers are as follows: Oil consumption of medium-speed diesel engines — Recommendation No. 17; The impact of fuels on lubrication — Recommendation No. 18; The Lubrication of large high-speed engines — Recommendation No. 20; Oil degradation — Recommendation No. 22; Gas engine lubrication — Recommendation No. 19; Treatment of the system oil in medium speed and crosshead diesel engine installation — Recommendation No. 24; Impact of low sulphur fuel on lubrication of marine engines.

To ensure maximum effectiveness, WG8 works closely with the CEC Special Group, Marine and Large Engines. This group supports the industry by developing and publishing methods for testing lubricants and lubrication.

Ongoing subjects identified by WG8 include multiple new research topics, of which four are currently being dealt with by the group. These include an update of Medium-speed engine lubrication guidelines — Recommendation No. 13; the impact of emission control measures on lubrication; inflammability of lubricant/fuel vapors in crankcases of marine diesel engines; and a used oil analysis interpretation guide. ●

Working Group 10 (WG10) Engine Users

**Chairman, Derek Walford,
Teekay Shipping Ltd.**

Working Group 10 has 46 members representing user companies in 16 countries worldwide. The group's activities include recording relevant test results in a users' database and these are, in turn, discussed with representatives from the engine builders, oil companies, equipment suppliers, and others at regular intervals, including at CIMAC Con-

gresses and CIMAC Circles. Two or three meetings are held each year in Asia or Europe.

The group's constituents consist of representatives from the engine builders, engine component suppliers and shipowners.

Ongoing subjects identified by WG10 include updating and analysis of the CIMACUSE engine database, information on and discussion of current engine failures and casualties, discussion sessions with engine builders and subsuppliers, engine guarantee and rating engine cylinder condition. ●

Working Group 13 (WG13) Turbocharger Efficiency

**Chairman, Dr. Ennio Codan,
ABB Turbo Systems**

The main purpose of Working Group 13 is to find one (or more) definitions of efficiency that are unambiguous and can be accepted by all parties involved. This definition(s) should be applied to all kinds of turbocharged engines, that is, two- and four-stroke, diesel, gaseous or any other fuel.

"Our work in this area is now practically finished; a Recommendation has been written, is currently being reviewed by the group members and will be released shortly," noted Dr. Ennio Codan, chairman of WG13.

The group's constituents consist of representatives from the engine builders and turbocharger manufacturers.

"The problem of developing a turbocharger efficiency definition is definitely not a very important issue for the large engine industry. Nevertheless the turbocharging system is a core component of the engine, and its importance is steadily growing," Codan explained. "Furthermore, the complexity of the problem is much higher than it appears at a first glance, and thus merits a detailed consideration of the numerous factors of influence."

The Recommendation should fill a gap in the norms that has led in the past to different definitions created by individual engine manufacturers. The situation was confusing and in some cases even misleading, according to Codan.

Further, the Recommendation sets clearly the boundaries of responsibility, and thus points the way toward calculating the efficiencies of the turbocharger and of the turbocharging system. At the same time the limitations in the determination of those efficiencies on the engine are pointed out. Turbocharger efficiency, measured on a turbocharger test rig under controlled boundary conditions, is hardly comparable with the value obtained from measurements on an engine with all constraints set by the limited space, the mutual interaction between engine and turbocharger and the turbocharger operation under unsteady flow conditions.

For engineers in the field WG13's work will provide a set of "rules-of-thumb" that should help them to calculate efficiencies easily and with reasonable accuracy using the available measurements and tools. For simulation specialists, some additional efficiencies are defined that cannot be measured on an engine, but can be calculated with the gas exchange simulation programs that are popular among engine developers. Here, it is important to be able to rely on standard efficiency definitions in the different software products, as these can be compared and provide valuable information on the turbocharging process. ●

Working Group 15 (WG15) Electronics & Software Systems

**Chairman, Rick Boom,
Woodward Governor Netherland B.V.**

The objective of the Working Group 15 is to cover the reliability and safety of (a) on-engine electronic components and (b) engine automation systems (both on- and off-engine). It is intended to supervise/ assist the implementation of the new technologies by (a) providing Recommendations to OEMs and their suppliers; (b) proposing a partnership to the certification authorities; and (c) facilitating end customers' understanding.

The current activities of WG15 have a focus on the large marine engine industry, as its members do have strong links and a high level of expertise in this particular field. A group of key members

continued on page 14

shave been identified, who on their turn reviewed new proposals for further activities. One of the activities is to create a CIMAC recommendation for interpretation of IACS and SOLAS rules for main single engine applications. This issue has been raised by WG2.

"There appears to be a need from the industry to have guidelines for main single engine failure modes. The need is concentrated on a general interpretation of the 'what if' scenarios," said Rick Boom, chairman of WG15.

The existing rules, on how a marine propulsion system has to behave upon a failure, are very clear. The well-known "lock in last position" or index freeze requirement has been laid down in the rules for many years. The rules are, however, not covering what to do after a failure has happened. Load changes from variable pitch propellers, shaft generators, etc., do have an effect on the engine performance and can potentially result in over speed trip condition. In general this is to be avoided at all times.

The guidelines for the "what if" scenarios will be useful for the marine industry. Based on guidelines, discussions between engine manufacturers, classification societies, ship owners, yards, etc., can be streamlined and improve propulsion system availability. As the classification societies play an important role in this process, there is a strong relation with CIMAC WG2, working on classification issues.

Also, the IACS Machinery Panel started to work on electronic governors for emergency Generators and IACS has requested CIMAC to deliver input to this topic. Another area of activity is delivering input to the WG2 on how electronic fuel injection control systems can get a system approval from classification societies. Currently, the control system hardware is type approved and every system has to go through separate system approval with classification. The request for this is based on the fact that too many similar systems have to go through system approval every time.

"There is a high level of expertise and experience of the WG members in combination with the recognition of a common and shared interest from the large

marine engine industry," Boom said. "The close cooperation with classification societies makes it such that WG15 activities do support and serve the large engine industry." ●

Working Group 16 (WG16) Auxiliary Systems – Design

**Chairman, Fred Deichmann,
Columbus Shipmanagement GmbH**

Working Group 16 held its first working meeting to introduce the necessary partners/participants from the relevant industries. This meeting was held late in 2006 in Augsburg, Germany.

Up to now WG16 consists of about 40 members from about 20 companies. Participants are users from shipping companies, as well as suppliers of marine diesel engines and related auxiliary machinery/components like pumps, compressors, heat exchangers, purifiers, filters and others.

At the meetings the following tasks have been worked out/defined: formulate the purpose and scope of the working group; define the scope of auxiliary systems; identify any relationships to other WGs; and develop a "mind mapping" structure to classify the auxiliary equipment by means of main systems, sub systems, modules and components.

In the second step all participants have been allocated to certain main systems in order to start this mind mapping process. The different mind maps will then be exchanged throughout the group and the correlation of the output from this process will start at the next WG16 meeting in May 2007. ●

Working Group 17 (WG17) Gas Engines

**Chairman, Lars Nerheim,
Ricardo UK Ltd.**

Working Group 17 was established at the beginning of 2006 with the aim to work within all aspects of gas engine technology to discuss important topics of general interest. In particular, WG17 will focus on areas including exhaust emissions, performance definitions, application and safety requirements, and gas quality issues.


The Working Group comprises specialists from the engine manufacturers, research and consulting organizations, component suppliers, classification societies, oil companies and universities. It is open to all CIMAC members with an interest in this subject.

"Currently, existing and often diversified background information is being discussed and assessed with the objectives of general awareness, possible simplification and harmonization," explained Lars Nerheim, chairman of WG17. "New information is also shared and evaluated as far as this becomes available. Although WG17 has decided to limit its field of activity somewhat, much information already exists about the various topics."

Going forward, WG17 is working along a couple of broad strategies. One, to produce position papers on the more urgent topics of the day, which typically could follow along the lines of the interaction between emission reduction strategies and efficiency trade-offs or ongoing gas quality issues. Two, longer term to work on a more comprehensive coverage of a given topic, which will have the form of a CIMAC Recommendation. For example, this could typically cover the installation and safety aspects for stationary gas engines or the installation and safety aspects for marine gas engines.

"The gas engine market has grown significantly over the years," Nerheim said. "Gas engines are already very popular for stationary power applications and are now also entering the marine sector — ships and offshore installations — where there is growing interest in using gas engines because of increasing environmental awareness and advances made in the gas engine technology itself."

WG17 is aiming to enhance the technical and scientific exchange of knowledge and experience and will deal with some of the most urgent issues for gas engines, such as exhaust emissions, safety and application guidelines, gas quality issues, as well as efficiency definitions. Appropriate technical information will be produced and published, which will help in promoting the gas engines themselves and also in the professional and correct application and operation of them. ●



**„Great news!
We got two of these
amazing engines.“**

32/44CR – More power, less consumption

Ever since its launch our 32/40 has been setting standards. And proven itself a thousand times over. With the 32/44CR we have raised output as high as 560 kW per cylinder. Without increasing weight or fuel consumption. The only thing to get left behind is emissions – thanks in part to our convincingly simple Common Rail system. With this package you can really do yourselves favour.

SEE DIRECTLINK @ WWW.DIESELGASTURBINE.COM

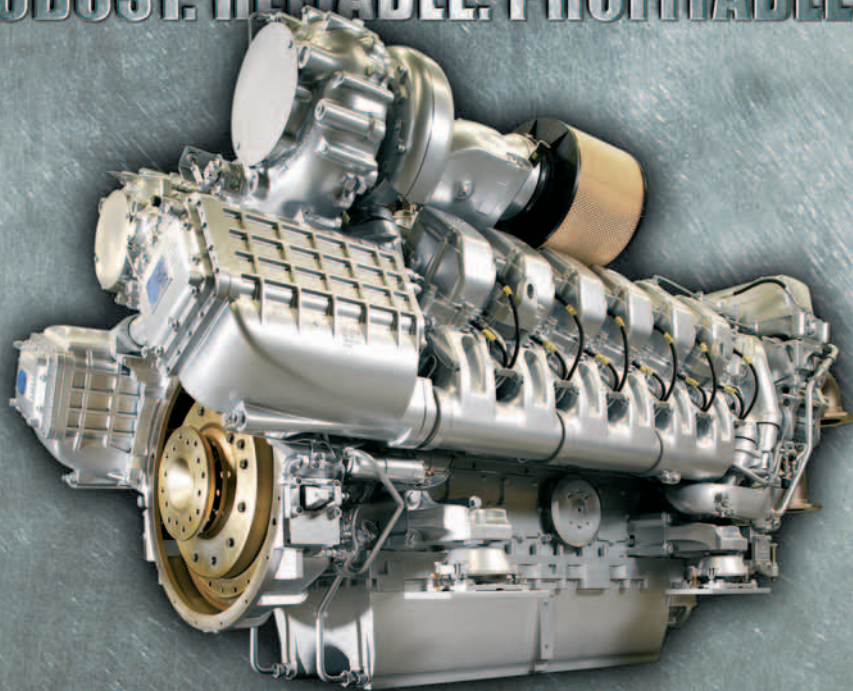
MAN Diesel – a brand of the MAN Diesel Group



MTU - A Tognum Brand

IRON MEN

ROBUST. RELIABLE. PROFITABLE.



MTU SERIES 4000 WORKBOAT EDITION

www.mtu-online.com



SEE DIRECTLINK @
WWW.DIESELGASTURBINE.COM