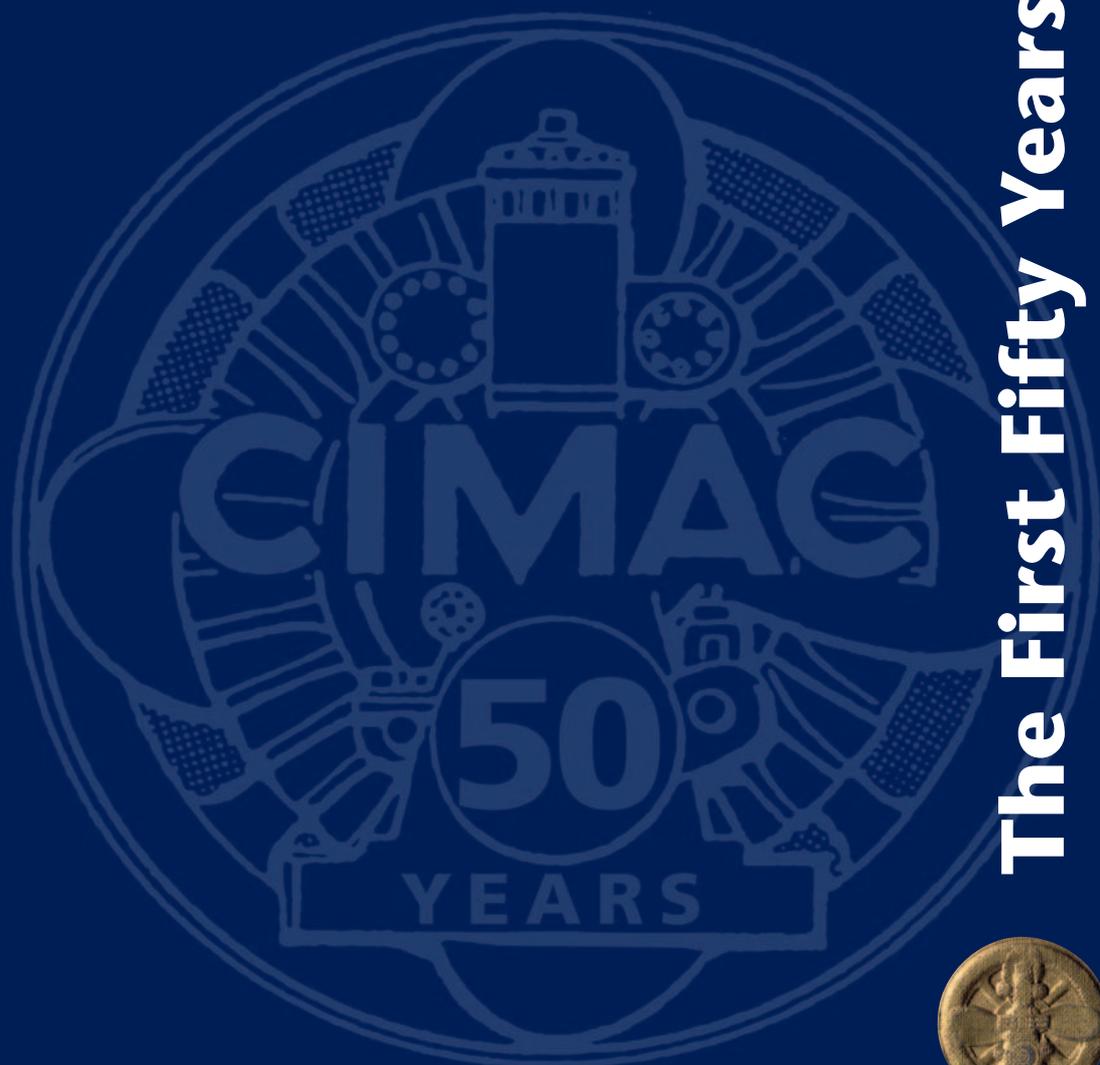


The First Fifty Years



CIMAC 1951 – 2001



**23rd CIMAC World Congress
on Combustion Engine Technology**

**May 7 – 10, 2001
Hamburg, Germany**



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The First Fifty Years

CIMAC 1951–2001

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CIMAC 50th Anniversary Book

**Address by William A. O'Neil, Secretary-General,
International Maritime Organisation (IMO)**



The internal combustion engine has a rightful place among the most important inventions and discoveries ever made. It can be ranked alongside the likes of the wheel, the ability to forge iron, the printing press and electricity as one of those developments that quite literally reshapes society for generations afterwards and completely redefines the way human beings interact with one another.

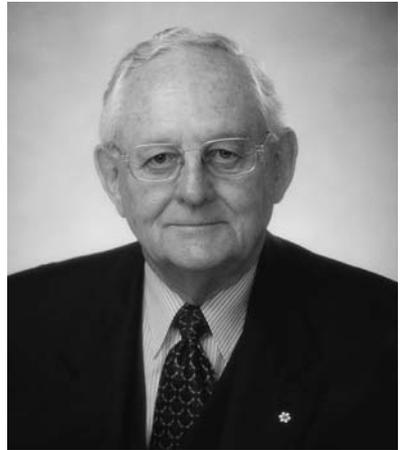
More than 100 years have now passed since the first internal combustion engines were produced. In that time, the technology has developed to the extent that the internal combustion engine is the most versatile, popular and efficient engine ever. It is used to power everything from lawnmowers to the mighty power stations. In celebrating its 50th anniversary, CIMAC is marking half a century at the very heart of that technology.

It is no exaggeration to say that we in the shipping world depend almost entirely on the internal combustion engine. We are firmly in the age of the motor ship and, despite the research and development efforts that take place in regard to other forms of motive power, that seems unlikely to change in the foreseeable future.

The shipping industry presents engine builders with an interesting challenge. It constantly seeks to build vessels that are larger, or faster, or sometimes both. Post-Panmax containerships of 5,000 to 7,000 TEU, cruise ships capable of carrying 3,000 passengers or more and high-speed ferries with speeds approaching 50 knots were little more than designers' dreams when CIMAC was launched 50 years ago. Now they are becoming commonplace. And there is every indication that the quest for speed and size will continue. Large containerships of 18,000 TEU and giant floating hotels with 10,000 or more people on board may be the dreams of today's designers, but how long before they, too, become reality?

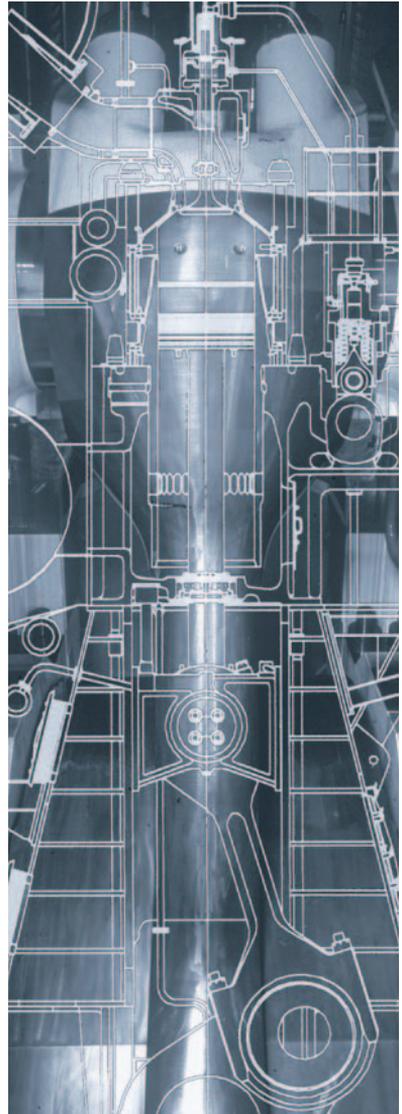
Against this background, the pressure on engine builders is to produce power plants that are smaller, lighter, more powerful and more economic. At the same time, engine builders are also being asked, quite rightly, to produce cleaner engines. At IMO, we are engaged in a continuous effort to reduce the level of environmental pollution from ships, and an important part of this effort is to address the emissions from ships' engines. We know that this is also a major concern of CIMAC and we watch with particular interest the developments in your Working Groups on exhaust emissions and heavy fuels. In the overall scheme of things, ships' engines may make only a small contribution to the pollutants that enter our environment. But, working together, we can make a difference, and that difference will be worthwhile.

I should like to congratulate CIMAC on 50 years of diligent, effective and valuable work as one of the major forums in which engine builders and users can consult with each other and share concerns and ideas. Any institution that lasts 50 years is clearly on solid foundations, and it is therefore with some confidence that I take pleasure in wishing CIMAC every success during its next 50 years, and beyond.





Welcome to CIMAC, the International Council on Combustion Engines. CIMAC has established itself as the leading international forum for the large engine industry and is very proud to be 50 years old and entering the 21st Century. CIMAC is a worldwide non-profit association consisting of National Member Associations (NMA) and Associate Members (AM) in 19 countries in America, Asia and Europe. It brings together manufacturers of diesel engines and gas turbines, users such as shipowners, utilities and rail operators, and also suppliers, oil companies, classification societies and scientists, among many others. CIMAC's Working Groups tackle important topical issues and publish their own CIMAC Recommendations. These contain a wealth of technical information as well as sound and practical advice.



50 Years of CIMAC

Introduction by Stephen G. Dexter, President of CIMAC

Some people dread their 50th birthday. Some even refuse to get out of bed in the hope it will never happen. At CIMAC, however, we got up early in 2001 and are celebrating with pride.

We were born in Paris and enjoyed our childhood and teenage years as our Congresses grew. We left home in our thirties and moved to London at a time when our Working Groups were becoming very active and we were getting better organised. Now, in middle age, we are based in Frankfurt and have grown into a truly international body with a function to be seen and a voice to be heard.

Thanks to all the work by George Fleischhack and Paul Russak you can now read some extracts from our life story. Many of you have been part of it. We hope you will enjoy and cherish these reminiscences and will stay with us to a ripe old age.



A handwritten signature in black ink, which appears to be 'S. G. Dexter'. The signature is stylized and cursive, written on a white background.

CIMAC – The First Fifty Years

A Portrait of the World's Scientific Society for Diesel and Gas Turbine Propulsion, Power Generation and Traction



*Opening Session
Zurich 1957*

Introduction

“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 [1].

29 years on, it has to be acknowledged that those who first envisaged CIMAC, then turned the idea into reality, have passed away. Documents from the early years are scarce and scattered all over the world. A few, however, could be retrieved, and allow us an insight into the creation and rise of a remarkable scientific organisation.

How it began

The war 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, meanwhile 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 neighbouring countries' efforts, what they were doing and why. Now, with mountains of problems unresolved, it was time to co-operate, compare experience, discuss problems and share insights into the future of the industry.

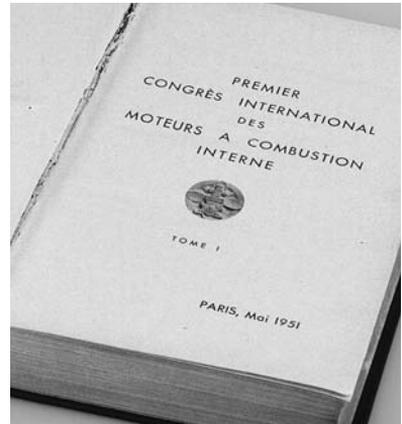
Although global congresses on power generation had often devoted specific sessions to the technology of internal combustion engines, it was felt the subject deserved its own forum [2].

The credit for initiating such a forum goes to Paul Tharlet and Jean Messiez-Poche of the French "Syndicat des Constructeurs de Moteurs à Combustion Interne". Jean Messiez-Poche: "L'intérêt d'un Congrès traitant du moteur diesel et de ses problèmes du moment fut évoqué au cours d'une conversation entre le regretté président Tharlet et moi-même, fin 1949" [1].

Paul C. Tharlet encouraged organisations from no fewer than nine other countries to take part, namely from Belgium, Denmark, Germany, Great Britain, Italy, Spain, Sweden, Switzerland, and The Netherlands [3].

The organisation was founded in June 1950 and named "Congrès International des Moteurs à Combustion Interne".

The term "Interne" was dropped from this name six years later at the Zurich congress, where gas turbines were included among the topics.



The acronym CIMAC comes from the French name "Congrès International des **M**oteurs **A** Combustion Interne".



Paul Tharlet, first president of CIMAC (1951 – 1957) and honorary president until his death in 1961

Paris 1951: The First Congress

The first congress in the history of CIMAC was organised by “Le Syndicat des Constructeurs de Moteurs à Combustion Interne” under its president Paul C. Tharlet, who subsequently became the first CIMAC President.

89 papers in all were accepted for the congress by the technical commission headed by Jean Messiez-Poche, who went on to serve for 23 years on the Permanent Committee of CIMAC.

This first CIMAC Congress was rated a remarkable success and attracted no fewer than 505 delegates from 15 countries. Its 87 “accompanying persons” were taken good care of by the “Comité des Dames”.

A balanced programme of technical sessions, works visits and social events lasting nearly two weeks duly impressed the participants, who were generous with their praise. The general feeling was clear; there was everything to be gained by holding another congress in the not-too-distant future [2].

The Comité Permanent

Discussions held between the heads of the participating national organisations resulted in an agreement to organise annual meetings devoted to individual topics as well as a full congress every five years. Paul C. Tharlet: “So, the working plan is: meetings, universal congresses every three, four or five years and – in the interim periods – yearly gatherings for specialised discussion” [4].

To promote itself, a “Bureau Permanent” – the English version of the proceedings refers to a “Permanent Committee” – was established by acclamation during the closing session of the first CIMAC Congress in Paris on Friday May 11th, 1951 [4].

Delegates were asked to establish national organisations and ask them to comment on the statutes drafted by the Secretariat and to apply for membership of the CIMAC Permanent Committee.

Paul C. Tharlet was elected president of CIMAC, with Haakon Andresen and Jan Goedkoop as vice-presidents.

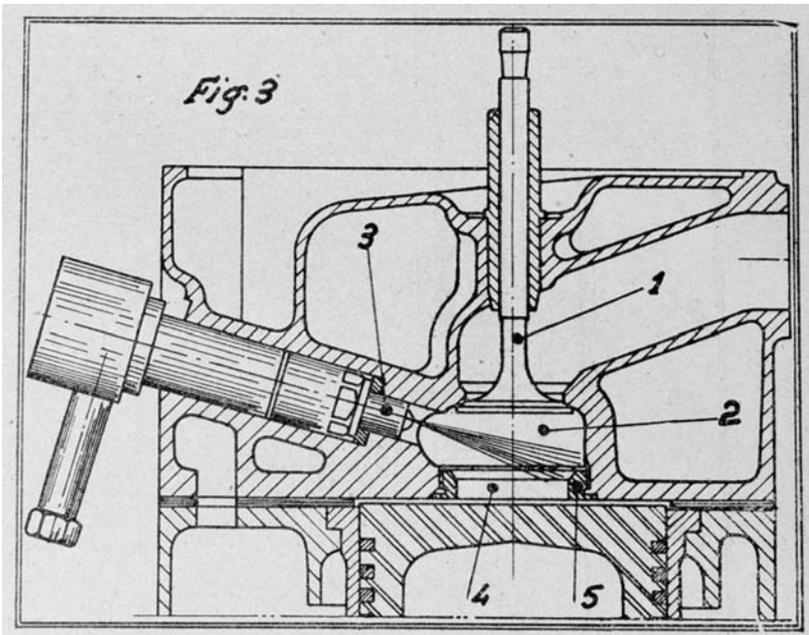
The key task of the Permanent Committee was to organise the affairs of CIMAC between the congresses on behalf of the member associations and to publish papers and proceedings.

As Masutaro Shibata, the later historian of CIMAC, writes: “The CIMAC Congress, held every two or three years, was gradually becoming recognised as one of the most important technical congresses in the field of internal combustion engines ... anywhere in the world.”

And further: “Papers for discussion and the proceedings published by each congress have become essential reading for engineers as well as university and technical school students.” [3]

Lessons learnt in Paris

Members of the Permanent Committee and delegates at the Paris congress had expressed their belief that future congresses should focus on specific scientific topics rather than deal comprehensively with all aspects of the design, construction and operation of diesel engines.



*“La Nouvelle
chambre de
Combustion UNIC”
– Paper presented
at Paris 1951 by
Gabriel Dubreul*



This proposal was, in fact, taken up already at the next congress in Milan, where the main theme was the use of heavy fuel oil in diesel engines [5].

Something else criticised in the wake of the Paris congress was the late distribution of papers, which allowed little time for study and consideration prior to the presentation. It is amusing to note that this problem is still unresolved today, even with all the information technology tools at our disposal.

Eventually, it was seen that alternately presenting or translating papers into the two congress languages, English and French, was both time-consuming and troublesome. The problem was solved at later congresses by providing simultaneous translation.

Location of CIMAC's first Central Secretariat at Avenue Hoche in Paris



The Statutes of CIMAC

The first CIMAC Statutes are dated March 13th, 1952, and dealt to a large extent with the organisation of the CIMAC Congress, as it was called in those days. It was not until the fourth edition, in 1973, that this name changed, with the statement that the organisation “shall be entitled International Council on Combustion Engines, abbreviated and referred to hereafter as CIMAC.”

A significant step was the second edition of 1955, in which the inclusion of rotary piston engines and gas turbines was affirmed. Gas engines were also accepted. Considering that the first congress in Paris 1951 had been devoted to diesel engines exclusively, this was an impressive widening of CIMAC’s horizon.

Later versions of the statutes dealt with the adaptation of the CIMAC organisation to the actual and permanent requirements of organising congresses and the work between them.

Also, as the years went on, it was felt that the organisation itself was less able to adapt quickly to new trends and respond in kind to emerging developments. Modifications felt necessary are found in the 6th to the 8th edition of the statutes.

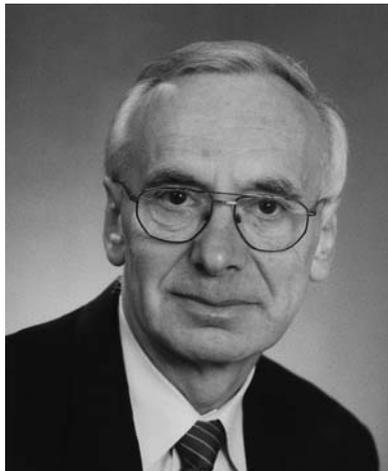
Significant changes that were instigated during the ‘nineties

- 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 up to the User. This has taken CIMAC more than forty 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” [4]. But who, on the other hand, could blame CIMAC at the time for writing “ivory tower” R&D papers instead of reports on operational experience [6].

- 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.

The most recent version of the CIMAC Statutes is No. 9, as approved on May 12th, 1999 [10]. Together with the changes already articulated in version No. 8 of November 1996, the latest version shows the dramatic changes that were felt necessary to give CIMAC the dynamic organisation it needs these days:

- The acceptance of “Associate Members” from countries where no National Member Association exists.
- The Board now being called the Executive Board (1996) and treated as such: “... shall have responsibility for the provision of management direction and ... for the policy control of the operating section of CIMAC assigned to it.”



George Lustgarten, the person behind and driving this effort to modernise CIMAC served as CIMAC's President from 1993 to 1995.

The CIMAC Logo

Delegates and the persons accompanying them to the first congress in Paris 1951 had been given a bronze medal showing, in relief, a diesel engine and a propeller:



CIMAC Logos on the congress proceedings, Paris 1951 (left) and Zurich 1956 (right)

In the proceedings of the closing session it can be read that “Admiral Hoare has submitted the proposal that this badge become the permanent insignia of our organisation” [4]. This proposal was duly accepted, and today the same CIMAC Logo – although it has undergone three re-designs over the years – decorates publications and promotional material of the CIMAC organisation world-wide.



Driving Forces and Innovators

Paul C. Tharlet, president of the Syndicat des Moteurs à Combustion Interne. He invited 10 European manufacturing associations to form CIMAC, which was established in 1951 during the first congress. Paul Tharlet was president of CIMAC from 1951 to 1957. He died in 1961.

Jean Messiez-Poche, chairman of the Technical Programme Committee of the first congress. He served on the Permanent Committee from 1951 to 1974 and was awarded the CIMAC Gold Medal in 1983. Together with Paul Tharlet, he transformed CIMAC from an idea to reality. Jean Messiez-Poche has also written a brochure on the first 21 years of CIMAC [1]. Siegfried Meurer: "He is the first person with whom M. Tharlet, the spiritual father and admired president of CIMAC, had discussed the idea, long before the technical world was ready to embrace it. CIMAC is indebted to Jean Messiez-Poche for the contributions he has made since the very first hour, and in particular for his work as historian of the first 20 years" [1].

Wahib Rizk tirelessly advocated the inclusion of gas turbines in the affairs of the congress. He served as president of CIMAC from 1973 to 1977. Under his guidance a procedure for electing the president by the Permanent Committee was implemented. He was awarded the CIMAC Gold Medal in 1983.

Lars Collin hands over the CIMAC Gold Medal to Jean Messiez-Poche at CIMAC Paris 1983



Georg Aue was active in CIMAC affairs right from the start, in 1951. Older CIMAC Members will recall the many papers and the lively contributions to discussions he so eloquently delivered in different languages. His decades of experience stood him in good stead in this. He was awarded the CIMAC Gold Medal in 1983.

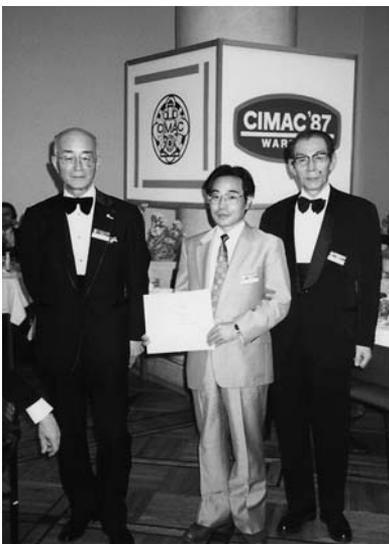
Masutaro Shibata, CIMAC's historian. While serving on the Permanent Committee from 1976 to 1993, he collected facts and names and wrote "CIMAC – Present Status and History", recording CIMAC's development from its creation in 1951 up until 1993 [3].

Hans List was a prominent member of CIMAC and one of its driving forces right from the very first congress in Paris in 1951 until 1990. He died at the age of 100 in 1996. He was awarded the CIMAC Gold Medal in 1983.

Lars Collin has been with CIMAC since 1955 and served on the Permanent Committee from 1968 until 1976. He was president from 1981 to 1983 and was awarded the CIMAC Gold Medal in 1985. He initiated the "Lars Collin Lecture" at the CIMAC Congress in Interlaken 1995.



*Georg Aue at
Warsaw 1987*



*Masutaro Shibata
(left) at Warsaw
1987 (with
Yukinori Sato and
Konji Okamura)*

Cecil French, president from 1983 to 1985, started the discussion in the Permanent Committee on how the organisation was to be modernised so as to be able to cope with the needs of our time. It was clear that the Working Groups needed more support. He suggested that a WG “Users” be established, and this was eventually done in 1992. He was awarded the CIMAC Gold Medal in 1993.

Hans Wesselo took over the presidency during the stormy time after Tianjin and was in office from 1989 to 1991. He will be remembered as the chairman of the Working Group “Heavy Fuels” and for its product: the CIMAC “Recommendations regarding Requirements for Residual Fuels for Diesel Engines”.

George Lustgarten was president from 1993 to 1995. His presidency saw the successful creation of CIMAC’s present organisation. During this time, the effectiveness of the Working Groups was improved and – by allocating specific responsibilities to the vice-presidents – many CIMAC activities gained new impetus. The CIMAC Central Secretariat was moved to Frankfurt in 1995.

Peter Sunn Pedersen has served for many years on CIMAC’s Permanent Committee, as Working Group chairman and was CIMAC President from 1995 to 1998. During his time in office the CIMAC Copenhagen Congress 1998 was organised, generally believed to be one of the best run CIMAC Congresses in history and one which will be difficult to beat. Unforgotten as well is his wry smile when lecturing on the two-stroke crosshead diesel as an intelligent engine.

Mogens Andersen was for decades the “crankshaft” of the Danish CIMAC community. As a “turbocharger man” he stood with one foot in each garden – turbomachinery and diesel design. This helped him to get new members to join CIMAC, users in particular. CIMAC was dear to his heart, as witnessed by his commitment to making Copenhagen 1998 such a success. Unforgotten, too, are the ideas he contributed and the effort he put into making the ABB Nights at so many CIMAC Congresses a real hit. Mogens also gave invaluable advice to the organisers of the 2001 congress in Hamburg. He passed away in the autumn of 2000. He will be sorely missed.

CIMAC Presidents since 1951

No.	Name	Country	From	Until
1	Paul C. Tharlet	France	May 1951	June 1957
2	Haakon Andresen	Denmark	June 1957	October 1961
3	Roberto de Pieri	Italy	October 1961	August 1964
4	Max Zwicky	Switzerland	December 1964	October 1969
5	Siegfried Meurer	Germany	October 1969	October 1973
6	Waheeb Rizk	Great Britain	October 1973	November 1977
7	Alberto Guglielmotti	Italy	November 1977	November 1981
8	Lars Th. Collin	Sweden	November 1981	November 1983
9	Cecil C.J. French	Great Britain	November 1983	November 1985
10	Masutaro Shibata	Japan	November 1985	November 1987
11	Meinrad K. Eberle	Switzerland	November 1987	November 1989
12	Hans H. Wesselo	The Netherlands	November 1989	November 1991
13	Helmut W.K. Maghon	Germany	November 1991	November 1993
14	Georg Lustgarten	Switzerland	November 1993	November 1995
15	Peter S. Pedersen	Denmark	November 1995	May 1998
16	Stephen G. Dexter	Austria	May 1998	May 2001

Data from [3]

*CIMAC Presidents
are elected by the
CIMAC Council
and hold office
from the end of one
congress until the
end of the next*

CIMAC – Developing its Style

Milan 1953: It rained. 315 delegates discussed 28 papers. The key theme was heavy fuel oil application.

Emil Soerensen reminded delegates of how heavy fuel applications affected not only the engine but, moreover, the ships' crews who had to deal with the mess: "In the event that human problems are commercialised, first class results cannot be expected, not even with heavy fuel oil in diesel engines" [5].

The Hague 1955: A double room at the Palace Hotel cost 28 Dutch guilders. 380 delegates listened to 28 papers being presented.

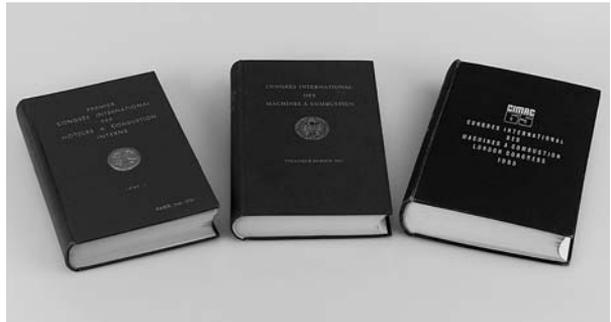
The majority of discussed papers focussed on diesel engines for railway traction, but papers were also presented on marine propulsion with diesel engines of more than 10,000 hp.

Amazingly, the "De Vereniging Van Metaal-Industriëen", which hosted the Den Hague Congress, had no fewer than 15 Dutch diesel engine manufacturers among its members [7].

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. One particular paper was devoted to the – today almost forgotten – free piston gasifier in combination with a gas turbine.

Zurich was also the first CIMAC Congress to be sponsored. A list of the manufacturers and institutions which gave material support to the Swiss organisers can be found at the end of the proceedings [8].



The CIMAC Congresses 1951 – 2001

Year	City	Number of Participants	Number of Diesel Papers	Number of Gas Turbine Papers
1951	Paris	505	89	–
1953	Milan	315	28	–
1955	The Hague	380	29	–
1957	Zurich	619	17	8
1959	Wiesbaden	790	29	7
1962	Copenhagen	749	24	6
1965	London	726	24	7
1968	Brussels	690	22	8
1971	Stockholm	719	34	15
1973	Washington D.C.	630	39	11
1975	Barcelona	870	38	19
1977	Tokyo	578	54	27
1979	Vienna	706	55	31
1981	Helsinki	687	60	27
1983	Paris	779	65	45
1985	Oslo	647	58	39
1987	Warsaw	582	67	29
1989	Tianjin	406	83	21
1991	Florence	428	74	29
1993	London	483	88	30
1995	Interlaken	520	80	19

In 1997 the CIMAC Council decided to change the practice of splitting the papers on gas turbines and diesel engines, and to combine them instead. Copenhagen 1998 was the first congress at which this policy was implemented.

Year	City	Number of Participants	Number of Papers
1998	Copenhagen	812	147
2001	Hamburg		156

Data from [1, 3]

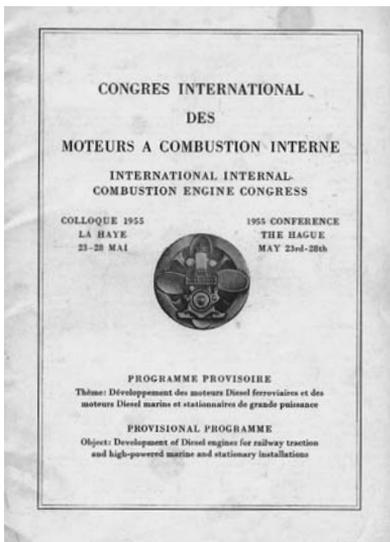
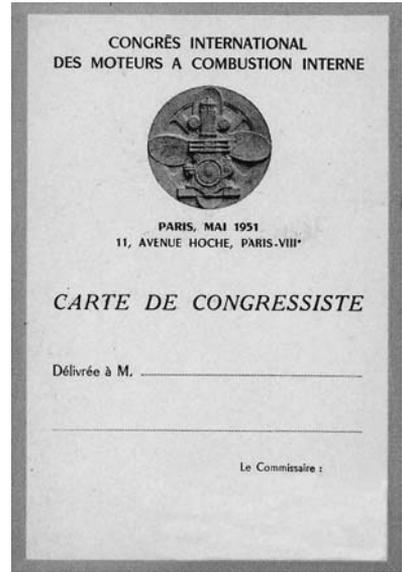
Memorable Congresses

Masutaro Shibata has recorded the impressions he took home with him from several memorable congresses. His reminiscences of Paris in 1983, Warsaw in 1987 and Tianjin in 1989 make especially good reading [3].

Other eyewitnesses remember

Paris 1951: Excellent catering and plenty of space to park cars on the Champs-Élysées.

Milan 1953: Heavy fuel oil application and ... it rained. Impressive post congress tours.



The Hague 1955: Railway traction, 10,000 hp per engine. Prince Bernard acted as patron.

Zurich 1957: The first papers on gas turbines, supercharged diesels, and delegates who were keen to clamber up mountains.

Wiesbaden 1959: Small diesels and gas turbines rated to 1,500 hp. Rhineland wine.

Copenhagen 1962: Diesel engines and gas turbines with up to 3,000 hp, and gas engines.

Registration Card 1951 (above)

Cover of the provisional programme of the third CIMAC Congress (left)

London 1965: Limiting noise, thermal shock, creep and corrosion in gas turbines.

Brussels 1968: Diesel engines with a bore above 700 mm, gas turbines in industrial and marine applications.

Stockholm 1971: New developments in diesel and gas engines and in gas turbines, and a Viking warship – the “Vasa” – which had just been recovered from the bottom of the Baltic Sea.

Photo by courtesy of MAN B&W Diesel A/S



Works visit
Copenhagen 1962

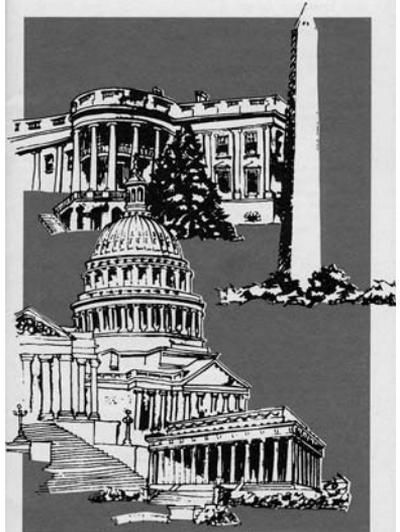
Washington 1973: The first CIMAC Congress to be held in the USA. New developments on non-hydrocarbon fuels, environmental problems, noise, vibrations. Total energy systems.

Barcelona 1975: The warm welcome extended to participants in a restored Spanish village.

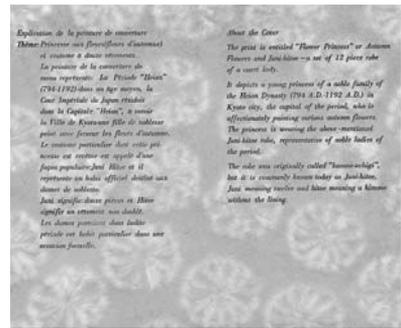
CIMAC 73 USA

10e Congres International Des Machines A Combustion
5-9 Avril 1973
Sheraton Park Hotel, Washington, D.C.

PROGRAMME PROVISOIRE



Le Congres est Organise par
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS



Tokyo 1977: The first CIMAC Congress in the Far East. Piston rings, fuels and lubricants, new material technologies, users' experience, combustion systems of the future, gas turbine combustion and emissions. Many delegates had their first contact with the Japanese way of life and of working at this congress. Impressive programme of post congress tours.

Vienna 1979: Rotary engines, environmental problems, coal-derived fuels for gas turbines, offshore applications. Cyclic temperatures above 2,000 °C. A gala dinner in the town hall – where the musicians disappeared when delegates began dancing.

Helsinki 1981: Diesel engines under extreme climatic conditions, total energy systems, fuel quality trends, coal and biomass. Fluidised bed gasification. The journey with the “Finnjet”.

Paris 1983: Back to CIMAC's roots in 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.

Menu card for the gala dinner at the first CIMAC Congress in Japan in 1977. The second congress in Japan will be held in Kyoto in 2004



Oslo 1985: Offshore applications for diesel engines, user reports, gas turbines for offshore and pipeline applications, combined cycle, non-conventional fuels, and ... the midsummer night.

Warsaw 1987: The first CIMAC Congress in Eastern Europe. Alternative fuels for gas engines, the impact of alternative fuels on the environment, the use of coal for gas turbines, and ... the Pope was in town (although he did not attend the congress ...).

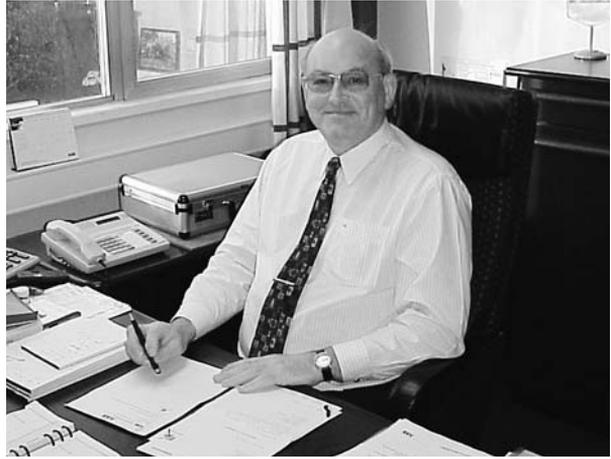
Tianjin 1989: The first CIMAC Congress to be held in China. In spite of “the unfortunate disturbance in Beijing”, as Masutaro Shibata puts it [3], the congress was a success due to the effort and flexibility of the Chinese organising committee. Engine management and monitoring systems for diesels, and gas turbines in integrated energy systems were the main topics.

Florence 1991: The limits of diesel technology, combined cycle systems, the electronically controlled power pack, gas turbines in combined cycles, computational analysis. The venue was originally supposed to be Abano Terme, but due to circumstances beyond the control of CIMAC the congress had to move to Florence at the last minute. Which gave the organisers the chance to show their skills to the full!

London 1993: Back to swinging London to celebrate 100 years of diesel engines. Other topics were engine management and maintenance, emission and fuel economy, new high-efficiency gas turbines, integrated energy systems. The reception at the British Museum: old horizontal steam engines.

Interlaken 1995: Reliability, low NO_x , the fuel cell, uncooled gas turbines, ceramic blades at 2000°C , and the ABB Night in a circus' big top.

Copenhagen 1998: A Users' Panel on reliability, educating engineers, fuel cells in combination with gas turbines, the CLEAN project, a poster session, an impressive exhibition, and the Tivoli gardens in spring.



*Mogens I. Andersen,
president of the
Danish NMA for
many years*

Sponsoring

Today, CIMAC could not survive without sponsors. Contributions from the NMAs cover only some of the costs of the slim Central Secretariat. Income from the sale of publications contributes marginally.

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 organisation and running of the congress.

Key Themes During the Past 50 Years

Here, our thanks should go to Masutaro Shibata, who has diligently listed the key issues on which CIMAC has focussed over the years [3].

A wealth of technical information is recorded in the CIMAC Congress proceedings



Looking back over the past half-century, it can be seen that CIMAC work has led developments and guided implementation world-wide. A look at just some of them is instructive:

Piston Engines:

Fuel Economy

This has been on the list of priorities since 1951. Papers presented at that time normally indicated a specific fuel consumption of about 225 g/kWh, although some experimental machines had achieved values of just around 200 g/kWh.

Papers presented in 1998 in Copenhagen record specific fuel consumption figures as low as 170 g/kWh.

Supercharging

In 1951 turbocharging was just starting to become a standard propulsion feature. However, with pressure ratios of no more than 2.0 the state-of-the-art bmeps were around 8 to 9 bar for the two-stroke diesel engine and 14 to 16 bar for the four-stroke type.

Two-stage turbocharging has been a frequent topic at CIMAC Congresses. However, today's single-stage technology with pressure ratios of 4.0 and above allows bmeps of 18 bar for two-stroke and 28 bar for four-stroke machinery.

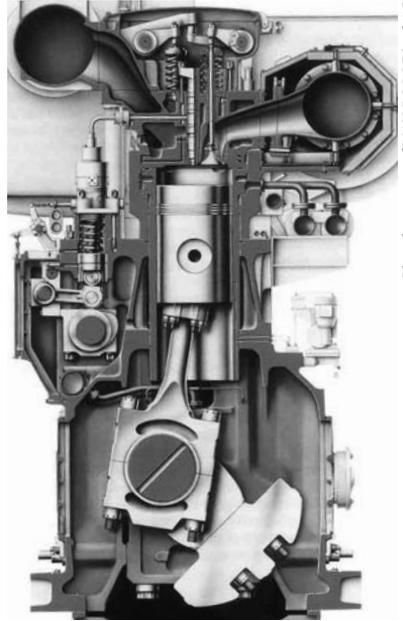


Photo by courtesy of MAN B&W Diesel AG

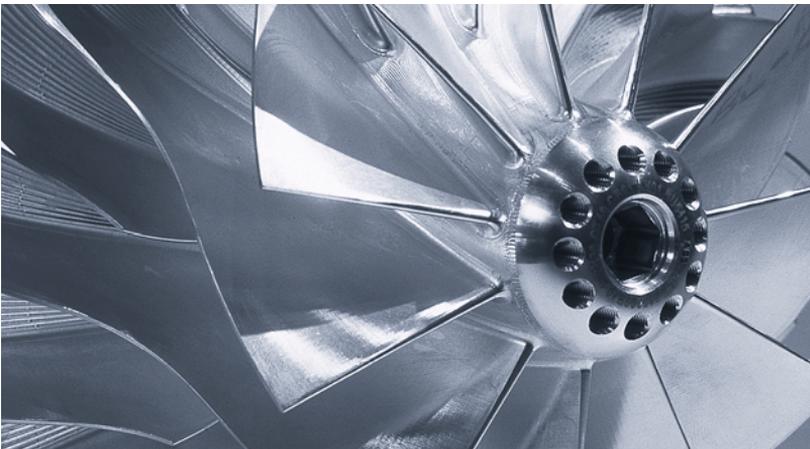
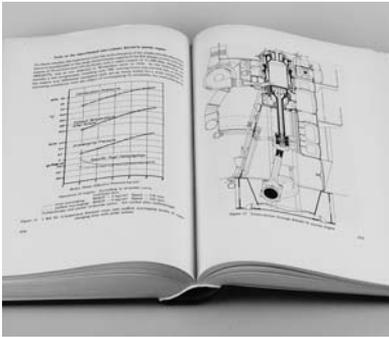


Photo by courtesy of ABB



Heavy Fuel Application

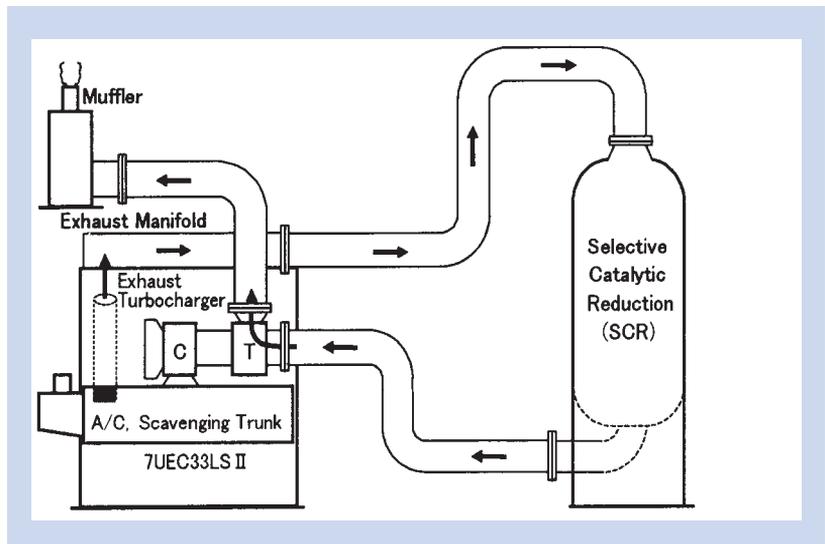
Looking at the early proceedings of CIMAC Congresses, it is amusing to note that complaints about the steady deterioration of heavy fuel oils are as old as CIMAC itself. However, many papers have dealt with methods that aimed at overcoming the problem. Moreover, with its Working Group “Heavy Fuels” CIMAC took an active step towards solving the problem on a global basis. Based on the “Recommendations regarding Requirements for Heavy Fuels

for Diesel Engines”, ISO developed the standard ISO 8217. This is accepted globally as describing, in indisputable terms, the minimum quality a diesel fuel must have. While this has not made heavy fuels better, it has made them more predictable.

Exhaust Emissions

Black or blue funnel smoke was a concern already back in the early days of CIMAC. It was a clear indication that combustion was anything but optimal, and that this condition had undesired consequences for the fuel consumption.

Exhaust Gas Treatment with SCR, Copenhagen 1998





Later, discussions focussed increasingly on the emissions resulting from the sulphur content of the fuel and the NO_x gases emitted during combustion.

These days, successful emissions management of an internal combustion engine is crucial, and a decisive factor when applying for a license to install and operate one.

It is fascinating to reflect on the still-ongoing, progressive improvement of the quality of engine exhaust gas – most often driven by the fear of fuel penalties – and the final realisation that each new target can be reached after all.

The Intelligent Machine

Hans Grossmann has asked the ultimate question: “Is there anybody on board today who can start and run the main engine manually?”

The Ceramic Engine

Everyone was fascinated by the prospects of an uncooled engine, and various concepts were presented over the years. In the end, nothing came of it – for thermodynamic reasons.



Gas Turbines

“In 1928 the gas turbine was generally considered to be utopian or of no practical interest”, said Maurice Roy in his keynote lecture at Zurich 1957. The subject of the lecture was the development of the internal combustion turbine, as he preferred to call the gas turbine [8, 11]. In the meantime, a large number of papers have addressed this subject, demonstrating that the designers of gas turbines have never given up the fight for better economy, more reliability and higher output.

*Naval Gas Turbine
10,000 s.h.p. 1951*

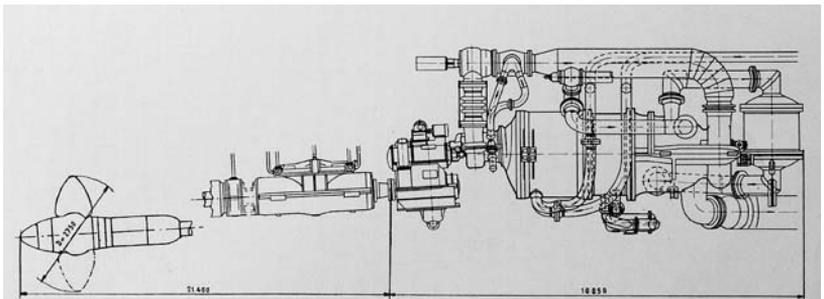


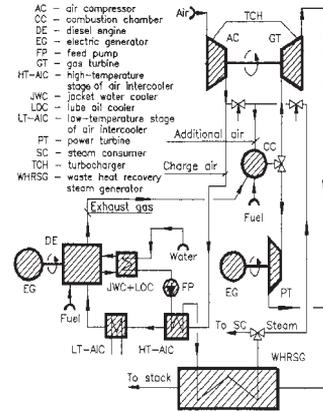
Fig. 7 Installation drawing for the 10,000 s.h.p. main propulsion unit with shafting, propeller servomotor and variable pitch propeller.

Co-generation

In Tokyo in 1977, gas turbine designers said that it should be possible to gain one g/kWh every year and so overtake diesels in fuel economy within 15–20 years. However, the diesel engine still leads when it comes down to which of the two is the most economic prime mover.

Just the same, many fascinating concepts could be realised during the 45 years in which gas turbine papers have been presented at CIMAC Congresses.

High temperatures and co-generation have been the key issues dealt with in CIMAC papers since Zurich 1957, often accompanied by convincing solutions to the problems.



The CIMAC Gold Medal

The CIMAC Gold Medal is awarded to individuals “on the basis of distinguished services to the combustion engine industry” [10].

Recommendations are made to the Council by the Executive Board. The Council decides which candidates are to receive the award.

Winners of the CIMAC Gold Medal

No.	Name	Country	Place	Date
1	Jean Messiez-Poche	France	Congress Paris II	1983
2	Hans List	Austria	Congress Paris II	1983
3	Georg Aue	Switzerland	Congress Paris II	1983
4	Waheeb Rizk	Great Britain	Congress Paris II	1983
5	Lars Th. Collin	Sweden	Congress Oslo	1985
6	Konji Okamura	Japan	Congress Warsaw	1987
7	Helmut Maghon	Germany	Congress Florence	1991
8	Cecil C. J. French	Great Britain	Congress London II	1993

Data from [3]



CIMAC Awards

Occasional awards were given at CIMAC Congresses and from 1983 a Best Paper Award was presented at each congress. The winner of this award is chosen by the two Vice Presidents Technical Programme “on the basis of the technical content, the presentation and the handling of questions” [10]. The prize is in the form of a certificate and a gift.



Winners of the Laurence Robson Award, Tokyo 1977

Best Paper Awards

Year	Congress	Authors	Title	Section
1983	Paris II	Paro, Liljenfeld, Blomberg	Experimental Investigations of Engine Components Exposed to Hazardous Load Conditions. Condition Monitoring Aspects	Piston Engines
1983	Paris II	Whitlow, Allen, Crombie	Combustion Turbine Blade Design Consideration. Prevention of Corrosion Assisted Mechanical Failure	Gas Turbines
1985	Oslo	Naquib et al.	Turbocharger Development and its Impact on Economy and Performance of Two and Four-Stroke Diesel Engines	Piston Engines
1985	Oslo	Takeya et al.	Development of the Advanced Reheat Gas Turbine (AGTJ 100A)	Gas Turbine
1987	Warsaw	Eberle, Paul	Possible Ways and Means to Further Develop the Diesel Engine in View of Economy	Piston Engine
1987	Warsaw	Sato et al.	New Design Concept of Liner Cooling Device for High Temperature Gas Turbine Combustor	Gas Turbine
1989	Tianjin	Snyder, Dexter	Looking into a Lean Burn Spark Ignited Gas Engine	Piston Engine
1989	Tianjin	Maghon et al.	Determining the Inspection Intervals Based on the Predicted Cumulative Damage of Hot Components of Gas Turbines	Gas Turbine
1991	Florence	Kirsch, Koroschetz et al.	New Bearing Types for Diesel Engines. Materials, Processes, Application	Piston Engines
1991	Florence	Keller et al.	Double-Cone Premix Burners for Gas Turbine Type 9 Retrofit Application	Gas Turbines
1993	London II	Hiroyasu et al.	Strategies to low NO _x and Smoke Emission Engines by Simulation	Piston Engines
1993	London II	Kawaike et al.	Advanced Cooling Design of Turbine Blades with Serpentine Cooling Passages	Gas Turbines
1995	Interlaken	Tagashaki, Okamura, Maikami, Nishi	Application of Ceramics to Gas Turbine Blades	Gas Turbines
1995	Interlaken	Brown, Scott, Warriner	Development of a Bi-Metal Alloy for Medium Speed Diesel Engines	Piston Engines
1998	Copenhagen II	Nishida et al.	Operation Results for the 501 G Gas Turbine at the Tasago Plant	Gas Turbines
1998	Copenhagen II	Hengeveld et al.	A Model for Lubricant Stress in Modern Medium Speed Engines and its Verification in a Wärtsilä 4L20	Piston Engines

Data from [3]

CIMAC Exhibition and Further Congress Events



*CIMAC Exhibition
Copenhagen 1998*

CIMAC Exhibitions

The first CIMAC Exhibition had been organised for the Paris 1983 congress. Exhibits included components, instrumentation and visuals showing state-of-the-art engines and equipment offered by French manufacturers.

Later exhibitions were open to all CIMAC Members, and – as Copenhagen has demonstrated – the exhibition is meanwhile appreciated as a useful means of obtaining “hands on” information about the subjects presented in the sessions.

The exhibition has grown over the years. At the Hamburg Congress in 2001 there will be around 100 stands.

The ABB Night

What would CIMAC be without its night out! A highlight, if ever there was one, was the private ABB Circus held for the CIMAC Congress in Interlaken in 1995.



Photo by courtesy of Spectrum

Post Congress Tours

More time was available for these in the past. After the first congress in Paris in 1951, 3 to 4 day tours were organised. On the itinerary were works visits and much-appreciated visits to places of cultural interest.

Milan 1953 and Tokyo 1977 were similarly impressive in this respect. A disappointment, however, was the unavoidable cancellation of a China tour planned for delegates in 1989.

The inspiration that grew out of these events and the spontaneous discussions that took place during them had a value all their own and cannot be overestimated.

Aware of the above, the Hamburg congress will give delegates options to participate in post congress tours with a high technological and cultural profile.

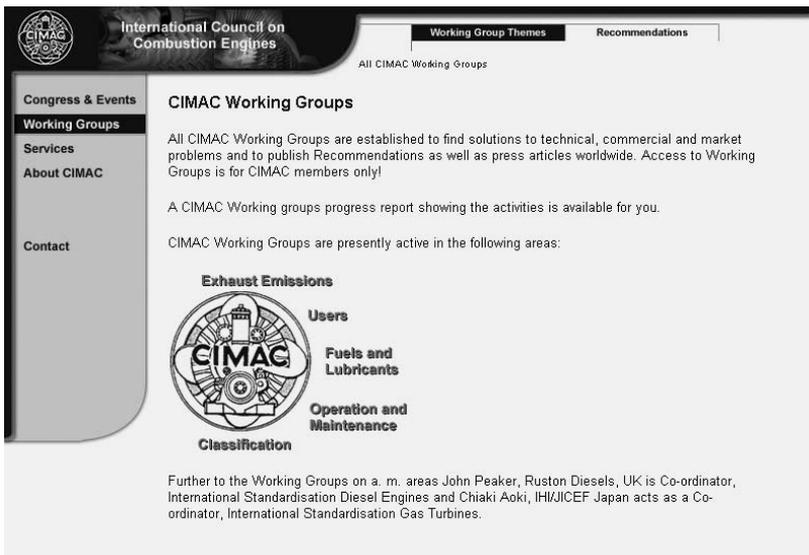
The Working Groups

It is difficult today to determine just when the first Working Groups 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 [9].

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.

A quick overview of the active Working Groups is available on the internet: www.cimac.com



The screenshot shows the CIMAC website interface. At the top, there is a navigation bar with the CIMAC logo on the left, the text "International Council on Combustion Engines" in the center, and two menu items: "Working Group Themes" and "Recommendations". Below the navigation bar, there is a sub-header "All CIMAC Working Groups". On the left side, there is a vertical menu with the following items: "Congress & Events", "Working Groups" (highlighted), "Services", "About CIMAC", and "Contact". The main content area is titled "CIMAC Working Groups" and contains the following text:

All CIMAC Working Groups are established to find solutions to technical, commercial and market problems and to publish Recommendations as well as press articles worldwide. Access to Working Groups is for CIMAC members only!

A CIMAC Working groups progress report showing the activities is available for you.

CIMAC Working Groups are presently active in the following areas:

- Exhaust Emissions
- Users
- Fuels and Lubricants
- Operation and Maintenance
- Classification

Further to the Working Groups on a. m. areas John Peaker, Ruston Diesels, UK is Co-ordinator, International Standardisation Diesel Engines and Chiaki Aoki, IH/JICEF Japan acts as a Co-ordinator, International Standardisation Gas Turbines.

Having dealt with topics such as the following

- acceptance tests,
- calculation methods,
- noise,
- SI units,
- a lexicon on combustion engines,
- liability questions,
- heavy fuel oils,
- exhaust emissions,
- lubrication,
- standards,
- classification societies.

CIMAC decided it was time to form the Working Group “Users”. The expectations that this WG has to live up to are considerable, not least because of the enormous need for CIMAC to measure itself against the feedback received from the field. The experience to date, however, gives good reason to be optimistic: The high level of interest in its very visible activities is causing the Working Group to grow rapidly.

What We Really Need – Focussing on the User

by Joern Dragsted

Highly skilled and specialised design engineers and scientists join together to develop the many fine engine concepts that co-exist today. With the help of sophisticated calculation tools and working in closely knit teams, they come up with a product that hopefully is unique but which, more than anything else, they see as *their* engine – even after it is sold. The creation of an engine is a continual process of research and development within the manufacturing company in close co-operation with associates, such as suppliers and scientific institutes. It is a rare event indeed when the engine user is invited to take part in the process; designers seem to believe that operational feedback will be collected by their own field or service staff. This is, of course, true to some extent, but in practice many types of “filter” exist between departments in all companies, and feedback that smacks of criticism is not always well received – especially when it comes from colleagues.

The engine user might not fully understand all the methods applied during the design process and consequently tend to regard the designers and makers with too much awe. It is the user, however, who has to deal with any eventual shortcomings of the otherwise fine design. As a practical engineer, he tries to solve difficulties on the spot, helped by members of his own – often small – organisation, and perhaps other engineers raised on the same “do-it-yourself” regime. If he has to, and really can’t avoid it, he will contact the engine builder’s spare parts & service division (the only moneymaker in the industry ...). But the last person he is likely to meet is the engineer responsible for the design.

CIMAC was created by the engine industry for the engine industry. Perhaps not so strangely, therefore, it has taken a long time for it to realise that in order to survive it has to embrace all the parties involved in some way with these machines. This is why CIMAC needs to focus especially hard on the user. Valuable service feedback to the designer would be gained in exchange for a better understanding of the design concepts and their limitations as seen by the user, not forgetting the chance it gives both to meet and get to know each other better. And the users, through their WG, would be able to speak with more authority.

The most important step towards ridding CIMAC of this obvious weakness was taken with the creation of the Working Group “Users”. This WG started work in 1993 with a handful of volunteers (and only three users!). Today, after several years of limited progress in achieving



*Joern Dragsted,
Chairman of the
WG “Users”*

the necessary attention from users, it has developed in size and geographical distribution. Some 35 genuine users are now members of the WG, and meetings are held in Europe as well as in East Asia.

The primary objective of the WG is to study and make recommendations in areas of engine design development and operation which are of special interest to engine users.

In practice, open discussions and exchange of experience in engine operation is the key purpose of any meeting of the WG "Users". There is no need for anybody to "defend their corner", and this makes for very good and inspiring meetings.

It wasn't long before it was realised that a "Users Database on Engines" was needed in order to effectively disseminate the accumulated experience. Analytical surveys based on information contained in this database should be an essential part of the users' feedback to the industry as well as to other WG members.

The database at present contains information on about 1,000 diesel engines. Papers on this subject are scheduled to be presented by the WG at future CIMAC Congresses. The WG is optimistic that the industry will join in the discussion of developments based on the Users' findings.

The WG "Users" sees itself participating in CIMAC life in the future as a unit with the same status and on the same footing as all the other parties. As the WG membership currently outnumbers all others it is planned to establish Sub Groups in different geographical areas. Two groups are currently active, one in Europe and the other in East Asia.

It goes without saying that CIMAC also has to adapt to this new situation. But it is equally obvious that the Users must play their part, and convincingly, in establishing the pool of experience that is necessary to be entitled to an equal say in future engine development.

The Working Groups over the Years

	Activity of WG	Established	Current Status
	Acceptance Tests Diesel	1961	closed
	Acceptance Tests	1968	closed
	Noise	1970	closed
	Alignment	1974	closed
	SI Units	1975	closed
	CIMAC Lexicon	1977	closed
	Liability	1981	closed
	Exhaust Emission Measurement	1986	closed
WG 1	Airborne Noise (AN)	1991	closed
WG 2	Classification Societies (CS-D)	1972	active
WG 3	Automation and Monitoring (A&M)	1992	active
WG 4	Crankshaft Dimensions (CD)	1984	active
WG 5	Exhaust Emissions Control (EEC)	1992	active
WG 6	Gas Turbines Emission Regulations (GT-ER)	1997	active
WG 7	Heavy Fuels (HF)	1978	active
WG 8	Marine Lubricants (ML)	1986	active
WG 9	Operation & Maintenance Contracts (O&MC)	1997	closed
WG 10	Users (U)	1992	active
	ISO Standardisation Diesel Engines		point of contact
	ISO Standardisation Gas Turbines		point of contact

Data from [3]

New Working Groups in Formation

Fuel Gas Analysis	pending CC approval
Electronic Products on Marine Engines	pending CC approval
Turbocharger Efficiency	in formation
Engine Control Interface Standards	in formation
Manufacturers/Users	in formation

Status 2001

The CIMAC Recommendations

Over the past 40 years no fewer than 20 such Recommendations have been published, some of them in editions of 2000 and more.

Some WGs have also managed to interface their work with global institutions like ISO, IMO, CEC, thereby underscoring a claim to be global centres of expertise.

The following CIMAC Recommendations have been prepared by the CIMAC Working Groups and most are available from the Central Secretariat:

No.	Title and abstracts	Status
1	Recommendations for Diesel Engine Acceptance Tests, 1968	Out of print
2	Recommendations for Gas Turbine Acceptance Test, 1968	Out of print
3	Recommendations of Measurement for the Overall Noise of Reciprocating Engines, 1970	Out of print
4	Recommendations for SI Units for Diesel Engines and Gas Turbines, 1975	Out of print
5	Recommendations for Supercharged Diesel Engines, 1971 Part I: Engine De-rating on Account of Ambient Conditions Part II: Engine Acceptance Tests	Out of print
6	Lexicon on Combustion Engines, Technical Terms of the IC Engine and Gas Turbine Industries, 1977	Out of print
7	Recommendations regarding Liability – Assured Properties, Publications, Fuels for Diesel Engines, 1985	Available
8	Recommendations regarding Requirements for Heavy Fuels for Diesel Engines, 1986 (superseded by No. 11)	Available
9	Recommendations concerning the Design of Heavy Fuel Treatment Plants for Diesel Engines, 1987	Available
10	Recommendations regarding Liability – Assured Properties, Publications, Fuels for Gas Turbines, 1985	Available
11	Recommendations regarding Fuel Requirements for Diesel Engines, 1990	Available
12	Exhaust Emissions Measurement – Recommendations for Reciprocating Engines and Gas Turbines, 1991	Available
13	Guidelines for the Lubrication of Medium Speed Diesel Engines, 1994	Available
14	Standard Method for the Determination of Structure-borne Noise from Engines, 1994	Available
15	Guidelines for the Lubrication of Two-Stroke Crosshead Diesel Engines, 1997	Available
16	Guidelines for Operation and/or Maintenance Contracts, 1999	Available
17	Guidelines for Diesel Engines Lubrication – Oil Consumption of Medium Speed Diesel Engines, 1999	Available
18	Guidelines for Diesel Engines Lubrication – Impact of Fuel on Lubrication, 2000	Available
19	Recommendations for the Lubrication of Gas Engines, 2000	Available

Data from the CIMAC Homepage (www.cimac.com)

CIMAC Today

The CIMAC Day

In order to keep CIMAC in the public eye in the years between congresses, the CIMAC Executive Board instituted the CIMAC Day. It was intended to hold one such event in each intervening year, but the CIMAC Day soon gathered a momentum all its own. Since 1996, when the first one was held in Hamburg, five CIMAC Days have taken place. In addition, local CIMAC Days and CIMAC Sessions have been held around the world. As many as 250 participants attend, and the trade press is always well represented.

Outlook: The World's Scientific Society for Diesel and Gas Turbine Propulsion, Power Generation and Traction.

To keep abreast of the times, CIMAC will have to keep on adapting. An Internet website is only the first step; soon, members will 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.



*CIMAC Day
during the SMM,
Hamburg 2000*

Photo by courtesy of MTU

CIMAC Steps Forward

by Stephen G. Dexter, 16th President of CIMAC

Will you come with us as we step into the future?

CIMAC has come a long way in 50 years. The next steps will be more exciting than ever. The world and our industry are changing and, of course, CIMAC is changing, too. Perhaps you have seen some changes already, but there are many more to come and I hope you will step forward with us and be part of these changes as they happen.

Someone is trying to sell you something everywhere you turn in search of information; the Internet, magazines, exhibitions, you name it. Of course they are selling. Competition in the power generation, locomotive and the marine engine world has never been greater. The successful organisations are selling and prospering, others aren't. Like it or not, that's business. But don't you sometimes yearn for the independent outlook? Wouldn't it be nice if suppliers gave truly comparative information, told you the weak points as well as the strong ones? Couldn't someone tell you whether a concept or a design really is successful in service, or tell you the best way to operate or service your engine? We can get official statistics, we have ISO standards, but where can we get sound, unbiased recommendations supported by all sides of industry?

CIMAC is the one body which combines agreed views from sellers and buyers, engine builders and users, oil companies and component suppliers, classification societies and research establishments. Many issues are beyond the resources of one company or trade association and, who would believe them anyway? Aren't they just trying to sell something? CIMAC is the one international body which can tackle the problems the whole industry is facing. It is the voice which is heard and trusted by government regulators and standards organisations, the International Maritime Organisation (IMO), railway organisations, classification societies and the like. This is our strength and this is what enables CIMAC to give practical support, as you can see at our Working Group Recommendations.

Today CIMAC is a vibrant and growing web of people. We started as a learned society, a talking shop amongst experts. We still are such and we still meet at our Congresses to present and discuss our views. But times change. Today we also meet at CIMAC Days to tackle urgent topics. We meet in our Working Groups to conceive and publish recommendations, developed by one group for the benefit of all.

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.

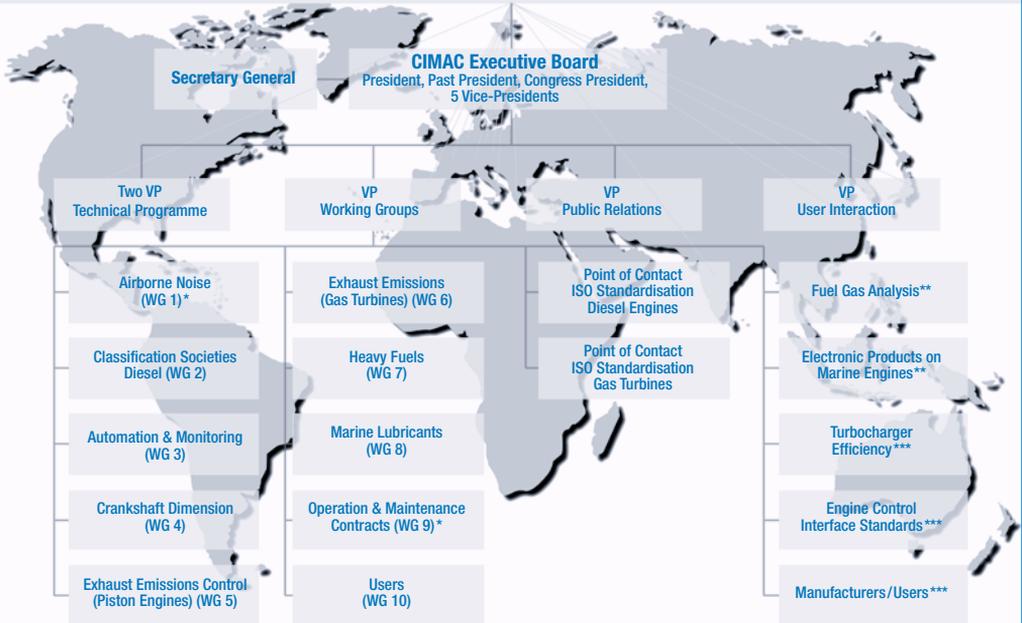
We won't forsake our heritage. We are still a learned society and we will still provide the opportunity to meet and talk. But these are no longer our prime functions. In the next 50 years engineers will have to be more selective with their information-seeking as the IT expansion continues. Decision-makers will look for sound information on new technology, considered opinions on important issues, calm, clear and practical words from those they can trust. Sound information will steer the engine industry, and CIMAC will be the forum where more of it will be generated.

This is CIMAC. This is our step forward into a future that will bring new concepts, new products, new standards and new methods of operation. Your views count. Why not take this step with us and benefit in the process?

How CIMAC is Organised

The CIMAC Council

The CIMAC Council (CC) consists of the Executive Board, 17 National Member Associations (NMA) and 3 Associated Members (AM). The CIMAC Council formulates CIMAC's policy, takes policy decisions and controls implementation. Each NMA has two delegates and one vote. AMs have one delegate and no vote. CIMAC's President is nominated by the NMAs and/or the Executive Board and elected by the CIMAC Council.



* closed/** new WG pending Council approval/*** new WG in formation

NMAs: Austria, China, Denmark, Finland, France, Germany, Greece, Italy, Japan, Korea, The Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, USA and 3 AMs: Indian Oil Corporation and Haas Power Services (both India), H. Cegielski R&D (Poland).

Status 2001

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The Authors



George C. Fleischhack, born 1938 in Dresden, trained as a locksmith and then as a ships engineer, graduated with an M.Sc. in Internal Combustion Engines from TU Munich, and then spent two years as a research engineer with MaK Kiel. Joined BP in 1968: 12 years Technical Services, followed by positions in marketing fuels and lubricants. Retired from BP 1994 as Manager BP Marine Europe. Since then active as independent consultant for marine fuels and lubricants. Member of the CIMAC WG “Lubricants” and a CIMAC “regular” since 1971. He lives with his wife near Hamburg/Germany.



Paul R. Russak, born in 1937. Family background: literature and book publishing. Worked for a time in pig and sheep farming, then saw active military service before going into the airline business. Over 20 years spent in marine propulsion and diesel engines for the power industry. Advertising Manager at Sulzer Diesel and Publicity Manager with ABB Turbo Systems Ltd. Elected CIMAC Vice-President for Public Relations in 1995. Made CIMAC visible in the world of diesel engineering, shipbuilding and amongst engine users. The driving force behind CIMAC Days, media contact and the CIMAC website, he successfully moved CIMAC away from its “ivory tower” approach. Retired from business life in January 2000, when he moved with his wife to a wine-growing region of Israel.

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