

# Chapter 1

***The 15<sup>th</sup> Anniversary***

## Introduction of IPA

The IPA is the academic organization to explicate the unseen phenomena and mechanism of underground by the Press-in Engineering in close coordination with various technical fields such as geotechnical, environmental, mechanical, construction and instrumentation engineering.

<b>Name of Association</b>	International Press-in Association (IPA)
<b>Date of Establishment</b>	16 February, 2007
<b>Board Members</b>	30

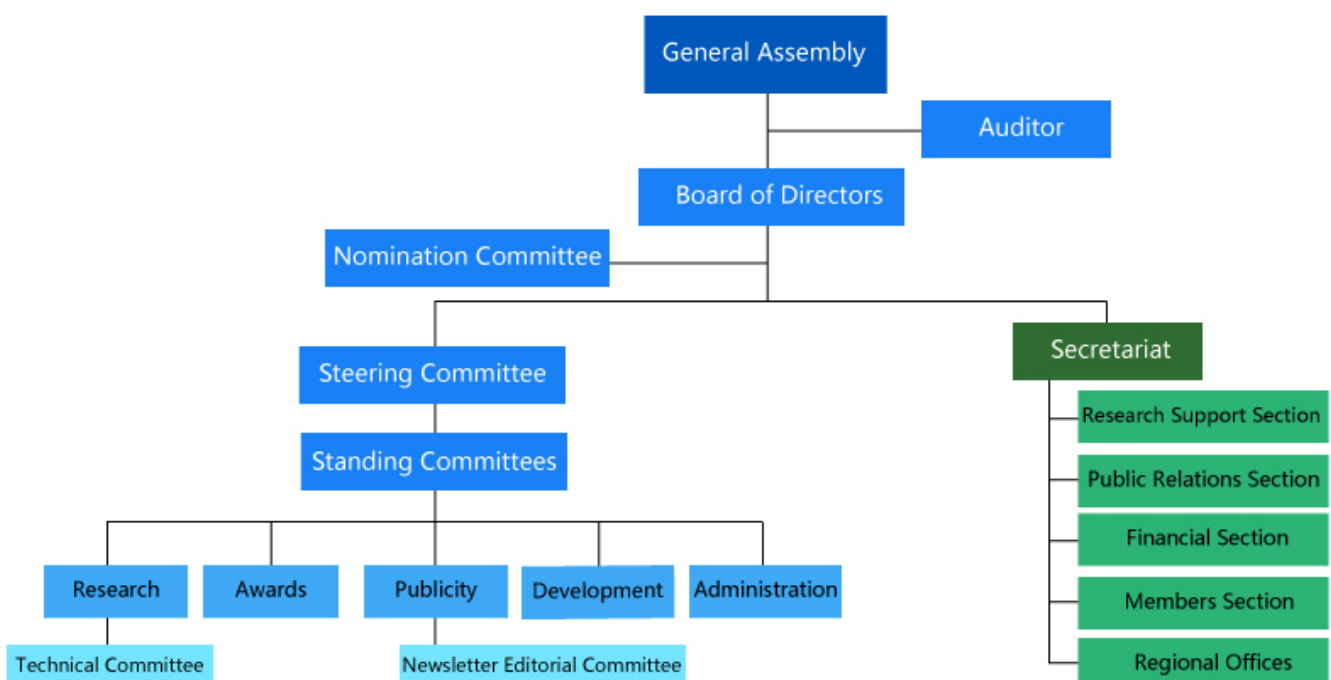
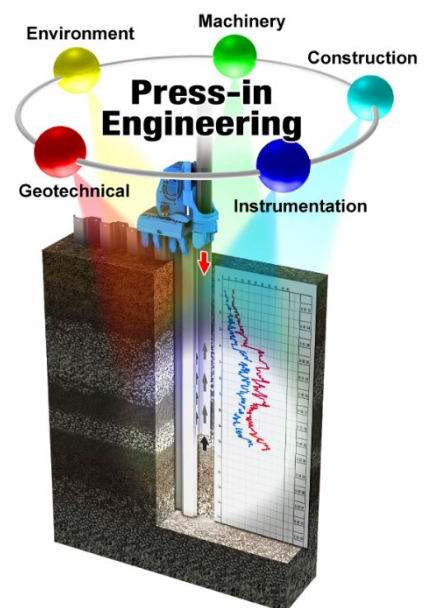
### ➤ Aim

- Establishing a worldwide network sharing an academic interest in the Press-in Method
- Social contributions following academic development regarding the Press-in Method
- Social contributions following human resource developments regarding the Press-in Method

### ➤ Activities

- Collection and distribution of technical information
- Providing opportunities to publish research and case studies
- Research to solve specific technical issues

### ➤ Organization



## Timeline

### 1975 - 2005

- ▶ 1975 The first SILENT PILER was developed by Mr. Akio Kitamura of GIKEN LTD. in Japan.
- ▶ 1994 The research collaboration started between GIKEN and the Cambridge University.
- ▶ 2002 Prof. D. White (University of Southampton) earned a PhD degree related to the Press-in Method.
- ▶ 2005 The IPA Preparatory Assembly was held at Kochi University of Technology in Japan by Mr. Akio Kitamura (GIKEN LTD.), Prof. Malcolm Bolton (University of Cambridge), and Prof. Hajime Okamura (Kochi University of Technology).



Research collaboration

### 2007 - 2011

- ▶ 2007
  - International Press-in Association (IPA) was established.
  - Prof. Malcolm Bolton assumed the first IPA President.
  - The first "IPA International Workshop" was held in the Cambridge University.
- ▶ 2008 The second "IPA International Workshop" was held in New Orleans, The United States.
- ▶ 2009 The first collection of research papers in Press-in Engineering "Press-in Engineering 2009" was published.
- ▶ 2010
  - The first IPA Press-in Engineering Seminar was held in Tokyo, Japan. (hereafter continuously annually held in Japan)
  - The third "IPA International Workshop" was held in Shanghai, China.



Founding members



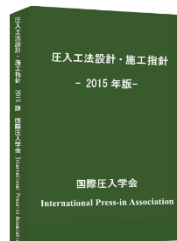
IPA Press-in Engineering Seminar

### 2012 - 2016

- ▶ 2012 The fourth "IPA International Workshop" was held in Singapore.
- ▶ 2014
  - "Design and construction manual of steel tubular pile earth retaining walls by Gyropress Method (2014)" in Japanese was published.
  - The fifth "IPA International Workshop" was held in Ho Chi Minh City, Viet Nam.
- ▶ 2015 "Design and construction manual of the Press-in Method (2015)" (in Japanese) was published.
- ▶ 2016
  - Dr. Osamu Kusakabe assumed the second IPA President.
  - IPA Newsletters started being published.
  - Press-in retaining structures: a handbook (First edition 2016) was published.
  - The Technical Committee (TC2) "Estimation of Subsurface Information from Data Obtained during Press-in Piling" was founded.



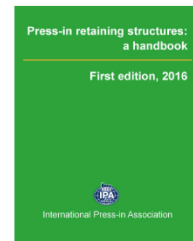
"Design and construction manual of steel tubular pile earth retaining walls by Gyropress Method (2014)"



"Design and construction manual of the Press-in Method (2015)"



First Issue of Newsletter



Press-in retaining structures: a handbook (First edition 2016)

## 2017 - 2021

- ▶ 2017
  - The first IPA Seminar on Press-in Technology was held in Singapore. (hereafter continuously held in Asian Countries)
  - The TC1 "Application of cantilever type steel tubular pile wall embedded to stiff ground" was founded.
  - The TC3 "Expansion of Applicability and Assessment of Seismic Performance of PFS Method" was founded.
  - IPA Website (English and Japanese) was renovated.



IPA Seminar on Press-in Technology



Website

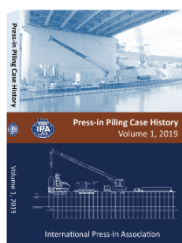


Technical Committee

- ▶ 2018
  - IPA Award related to Press-in Technology was founded.
  - The first International Conference on Press-in Engineering (ICPE2018) was held in Kochi, Japan.
  - IPA Secretariat was reformed and IPA Regional Offices were founded.
- ▶ 2019
  - "Press-in Piling Case History Volume 1, 2019" was published.
  - IPA Library was founded.
  - The TC4 "Vertical performance and construction management of sheet piles installed by the Press-in Method and tubular piles installed by Rotary Cutting Press-in Method" (TC4) was founded.
  - Chinese Version of "Press-in retaining structures: a handbook" was published.
- ▶ 2020
  - "Design and construction manual of the Press-in Method (2020)" (in Japanese) was published.
  - The TC5 "Influence of operator skill and experience on field performance of Press-in Piling" was founded.
  - Prof. Chun Fai Leung assumed the third IPA President.
  - IPA Website in Chinese was launched.
  - "New Horizons in Piling" was published from CRC Press.
- ▶ 2021
  - The TC5 "Investigation and analysis of the development status of Press-in technology in China" was founded.
  - The second International Conference on Press-in Engineering (ICPE2021) was held online.
  - Press-in retaining structures: a handbook (Second edition, 2021) was published.
  - Press-in retaining structures: a handbook in Russian, Thai and Portuguese version were published.



ICPE2018



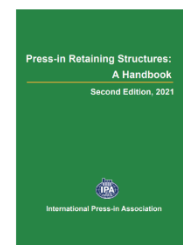
Press-in Piling Case History  
Volume 1, 2019



Chinese Version of "Press-in  
retaining structures: a handbook"



Design and construction manual  
of the Press-in Method (2020)



Press-in retaining structures:  
a handbook (Second edition, 2021)

## ***Message from Honorary President***

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**Akio Kitamura**  
*Honorary President*

Executive Chairman, GIKEN LTD.

As one of the founders of the International Press-in Association (IPA), I am very happy and proud to see that the IPA is celebrating its 15th anniversary since its establishment in 2007, and its philosophy and activities are spreading all over the world. Forty-six years have passed since the invention of "SILENT PILER®", the first practical application of the "Press-in Principle", and in the meantime, "Press-in" has spread all over the world and a new "Press-in Industry" has been born and developed.

What happens underground had been left unascertained by even the professionals of underground construction on the fact that "Underground is invisible, so we don't know what happens underground." The IPA was founded with the aim of "making the invisible underground visible", and it is a great pleasure that the aim has been realized and the "superiority of the press-in principle" has been proved by engineers and researchers around the world, and there is no doubt that there is a great potential and future for the press-in method. However, a number of people, trapped by precedentism, still use unscientific design and engineering methods.

In the Great East Japan Earthquake in 2011, about 20,000 people died when a huge levee, its existence had been absolutely trusted, collapsed easily and allowed the tsunami to invade. Although the vulnerability of the footing structure was exposed by the disaster, the same structure that is further enlarged and simply covered with concrete was adopted in many places for reconstruction.

Recently, we have been hit by heavy rains every year and there have been many cases of earthen levees collapse, sinking the invaluable resources such as human lives, culture, history, and many kinds of property into the muddy waters all over the country. Despite the fact that these are disaster prevention structures that should protect lives and property, the government's outdated policy of "Levees shall be constructed by piling up soil" as stipulated by government ordinance, remains unchanged. Instead, we should incorporate the latest science and technology into the area of national disaster prevention which is the most important issue and build tenacious structures that never collapse.

Furthermore, the shortage of manpower in the civil engineering and construction industries is a serious problem. We need to change to automated and unmanned construction methods instead of the old methods that require people on site. In addition, the reduction of carbon dioxide emissions to curb global warming has become an important issue worldwide that needs to be addressed.

Press-in method has the advantage to solve these urgent issues fundamentally. The "Implant Structures" constructed by the press-in method are able to withstand earthquakes, tsunamis, and heavy rains because each structural member is rooted deep into the ground and becomes an integral part of the earth. The construction method is not only vibration-free and noise-free, but also requires no temporary work, making it possible to rapidly build the desired structure with saving space while significantly reducing carbon dioxide emissions. The simple process of installing structural members manufactured at the plant on site makes it the most suitable method for automation of construction.

Expectations for the future of IPA are even higher and its responsibilities are also heavier. We have to take each of the advantages of the press-in principle as an academic subject and prove them through science and develop new construction methods and structures based on the outcomes of the research, and utilize them for the benefit of all the people around the world. In order to achieve this goal, it is necessary to gather a wide range of wisdom from all over the world and to promote result-oriented activities.

Lastly, I would like to express my respect and gratitude to all the engineers and researchers who are dedicated to the research in Press-in Engineering all the time, and to all the people who have made great efforts in this field.



## *Messages from Successive Presidents*

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**Malcolm Bolton**

*Founding President (2007-2015)*

Professor Emeritus, The University of Cambridge

I have the honor to send this message as the founding chairman of the IPA, retired from the post in 2015. And I extend my sincere congratulations on the 15th anniversary of the IPA establishment. I'm certain that I could celebrate the commemorable occasion thanks to my successors, Dr. Osamu Kusakabe and Dr. Leung Chun Fai, and also everyone who continuously support IPA for a long time. The most salient feature of my 10 years with the IPA was equally the highlight of my previous 28 years collaborating with GIKEN LTD. – the ongoing development of press-in technology to serve the changing requirements of the construction industry as it responds to new priorities set by society.

When the IPA was founded, the main emphasis was on efficient and socially responsible urban reconstruction, exploiting the precision and speed of the GIKEN technology of silent piling and, in appropriate installations, the ingenuity of the Reaction Base System to establish a footprint-free production line. Early IPA Seminars in Kochi focused on identifying fundamental soil-pile interactions and predicting press-in performance, capitalizing on the research collaboration between Cambridge University and GIKEN. This fundamental research continues, in the hands of Dr Stuart Haigh and Mr. Yukihiro Ishihara. Both installation issues and the performance of finished implant structures have been addressed.

More recently, and especially after the terrible 2011 Tohoku earthquake and tsunami, the theme of disaster prevention became important, with particular emphasis on flood mitigation. The political will to improve tsunami disaster resilience in the southwest of Japan was very clearly expressed in a presentation to the 7th IPA Press-in Seminar in July 2014 by the ex-Governor of Kochi Prefecture, Mr. Masanao Ozaki. Meanwhile, the massive effort that had been devoted by GIKEN to the development of the Gyro Piler, which is capable of coring through old foundations and hard ground to embed large diameter steel tubes to form an interconnected sea wall, was coming to fruition in new coastal defenses to mitigate any future Nankai mega-earthquake and tsunami. The imperative to protect coastal communities against such threats has, no doubt, been mainly responsible for the attendance at the annual Kochi Press-in Engineering Seminars increasing significantly. And the same imperative led GIKEN to support a further PhD student at Cambridge, Mr. Srikanth Madabhushi, who has been testing physical models of implant wall systems under lateral load in the large Cambridge beam centrifuge. Very interesting results are emerging which will add confidence in designing such structures in future.

An initiative has also been taken to deliver the “I” in IPA, making both research and application more relevant internationally. A series of biennial International Workshops was inaugurated in Cambridge in 2007, followed by New Orleans in 2008, Shanghai in 2010, Singapore in 2012 and Ho Chi Minh City in 2014. Following a call for proposals, IPA Research Awards were allotted at each Workshop, and the findings presented at the succeeding Workshop. Each International Workshop also featured lectures and visits relevant to their location, as well as presentations on the state of the art of Press-in technology and its recent applications. A field visit in New Orleans, to look at the urgent raising of flood defenses after the catastrophic flooding caused by hurricane Katrina, remains in my mind. We saw, in real time, the haphazard rate of construction of a traditional hammered sheet pile wall, in comparison with a second contract just a few hundred meters away where press-in piles were being installed smoothly and much more rapidly.

Each of the International Workshops has generated proceedings that have been published as a Press-in Engineering volume. All this research and practice has now been amalgamated into the “Design and Construction Guideline for Press-in Piling” in Japanese and “Press-in retaining structures: a handbook” in English, respectively. Currently, multilingualization of the latter publication is ongoing and to be published in the near future. The international dissemination of press-in technology will remain a key feature of the IPA mission in the years ahead. I look forward to assisting where I can.

May the IPA continue to flourish!

## *Messages from Successive Presidents*

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**Osamu Kusakabe**

*Second President (2016-2019)*

Executive Director (2020- )

Professor Emeritus, Tokyo Institute of Technology

It is my great honor and pleasure to send this message on the IPA 15<sup>th</sup> anniversary.

I first came to know, in 2005, that there is a move to setup a sort of organization of press-in piling. Dr. Kohzoh Tagaya, then an Emeritus Professor at the Kochi Technical College, asked me on my personal view on possible establishment of a learned society related to press-in piling at a lobby of the hotel where the 16th International Conference on Soil Mechanics and Geotechnical Engineering was being held at Osaka, Japan. My first reaction was to recommend him to setup a technical committee within International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), because my understanding at that time was that press-in piling was emerging as a promising new piling method.

Two years later, a piece of request came to me from GIKEN LTD., asking me to join the inaugural ceremony of International Press-in Association (IPA) to be held in Cambridge University in February in 2007. Cambridge is the place where I studied as a graduate student many years ago, and I happily accepted the request. The venue was Moller institute newly built in the campus of Churchill College where I lived during my PhD student time from 1979 to 1982. Soon after I arrived at a room at the Moller institute late evening, there was a telephone call, asking me to join a dinner party at Trinity College, where Prof. Malcolm Bolton, Mr. and Mrs. Kitamura and other participants were already having a good time.

Next day, on February 16, 2007, the IPA constitution was presented at the inaugural ceremony. I realized that the objective of the IPA seemed very much challenging. The constitution stated that the IPA aims to cover not only geotechnical engineering, but also multi-disciplines related to press-in piling including geotechnical engineering, mechanical engineering, information engineering, environmental engineering as well as construction methodology. I realized then the reason why my suggestion to form a technical committee within ISSMGE had not been accepted. What immediately occurred to my mind, however, was that the actual operation of the IPA would be tough and challenging, because the historical development of modern science clearly indicates the process of fragmentation of discipline towards narrower and narrower, and deeper and deeper into a small subject. The IPA tries to go in an opposite direction towards the process of integration of discipline in a holistic manner. Real construction process is, in fact, the process of integration, requiring engineers with various disciplines. Modern construction practice greatly utilizes various construction machines with respective experienced operators. Thus, construction site is a typical example of the integration of machine and operator.

My role in the IPA in the first several years was not so hectic and mainly just to attend a series of press-in seminar in Kochi once a year, giving a brief speech at the closing ceremony both in Japanese and English. My role also included to attend press-in workshop held overseas every other year, giving an informal speech at the banquet. I had opportunities to attend the press-in workshop at New Orleans in 2008, Shanghai in 2010 and Singapore in 2012.

My real challenge started when I took over the role of Presidency from the Founding President, Prof. Malcolm Bolton, in 2016. Before accepting the role, I wrote a memorandum down on an A4 size paper in October 2015, which listed my plan on various aspects of IPA, ranging from reviewing the constitution and publishing technical books such as an introductory book, quarterly Newsletters, to organizing an international conference, seminar and establishing technical committee. Thanks to kind supports from many IPA members, most of my challenging plans have been materialized in my term of Presidency, as was reported in the Newsletter Vol.5, No.2 in 2020.

But there are two exceptions which are not materialized yet. The exceptions are (1) to publish a comprehensive technical book on press-in piling in Japanese for Japanese construction market, and (2) to form an industrial association like the Japan Press-in Association now consisting of more than 200 press-in piling companies, in various regions across the globe.

The item (1) could be possibly prepared, based largely on the contents of State-of-the-Art Report presented at the 2nd International Conference on Press-in Engineering (ICPE), in 2021. It is my hope that the authors of the State-of-the-Art-

Report could offer an effort to achieve this plan.

Regarding to the item (2), we may require some more time until the press-in piling market becomes mature enough to attract piling contractors to form an association in a region. On-going project of multilingualization of the Press-in Handbook into French, Russian, Portuguese, Thai, and Vietnamese on top of existing English and Chinese version, will certainly facilitate and accelerate the process of the item (2). It is very much promising that my successor, Dr. Leung Chun Fai, has a plan to continue the project of multilingualization to cover ten different languages in total.

During my term of four years, I always bore my feeling at the inaugural ceremony in mind, how to operate the IPA activities meeting the key objective, that is, the integration of multi-discipline. Towards the integration, IPA has recently initiated two projects related to integration of machine and operator. There was a series of IPA Newsletter article on historical development of press-in piling from Vol.5, No.3 to Vol.6, No. 1. They are now being compiled and edited to form a booklet entitled "A brief development history of press-in machinery" to be ready for distribution in the fiscal year of 2021, which forms a part of IPA 15<sup>th</sup> anniversary project.

IPA also established a technical committee TC5 on "Influence of operator skill and experiences on field performance of Press-in Piling" in 2020. The paper presented at the 2nd ICPE concludes that operator's experience and skill play an important role for effective press-in piling with a minimum risk for damaging the press-in piling machines. Further efforts must be made to fill the gap between machine and operator, and between design office and actual construction site to achieve the integration.

Towards the end of my term, COVID-19 started spreading globally. This pandemic has made impossible executing various face to face events, including Board Meeting, seminars, and 2<sup>nd</sup> ICPE. Thanks to ICT technology, IPA is overcoming the difficulty in having face to face events and on-line meetings are now in common in IPA operation, facilitating more participation to IPA activities from various parts of the world.

Looking back to my fifteen years involvement in IPA, obviously, it appears that my four years term of Presidency was not enough to achieve the ultimate objective of IPA, that is the integration of discipline, integration of machine and engineer/operator. I am sure that the following Presidents will continue to pursue this challenge years ahead.



## ***Message from Current President***

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**Chun Fai Leung**

*Third President (2020-)*

Professor Emeritus, National University of Singapore

It is with great privilege and pleasure in the capacity of the current IPA President, I have written this message to commemorate the 15<sup>th</sup> Anniversary of the Association. Taking over the Presidentship of the Association in June 2020, I must first thank the great contributions of Founding President Prof Malcolm Bolton and Immediate Past President Prof Osamu Kusakabe, both are my good friends whom we know each other for a long time. Malcolm had laid a very strong foundation for the Association spreading many international workshops and seminars on press-in piling and bringing IPA into the international limelight. Osamu continued the great work and one of his key contributions is the inauguration of the International Conference on Press-in Engineering. This inaugural conference held in Kochi, Japan, in 2018 attracted over 400 participants worldwide providing a much higher level of interaction among researchers and practicing engineers involved in press-in Engineering. Osamu also spearheaded several important publications including the very practical and insightful Press-in Retaining Structures Handbook second edition.

When I took over in June 2020, the world was at the height of COVID-19 pandemic which is still prevalent in many parts of world today. As such, all the IPA activities during my Presidency were held on-line, and a couple of face-to-face international seminars have to be postponed. Despite the above-mentioned adverse situation, I am pleased to report that the Second International Conference Press-in Engineering held on-line in June 2021 attracted 430 participants. The number slightly surpasses the attendance of the inaugural conference in 2018 and this is indeed a significant achievement during the present difficult time. As such, I wish to express my sincere thanks and appreciation to the tremendous efforts by the Conference Organizing Committee. In addition, the above-mentioned Handbook has been published in English and the translation of the Handbook in different languages including French, Russian and other languages is in progress with an aim to outreach to a much wider international community. During this challenging period, the IPA Newsletter is a key channel of communication among IPA members and the researchers and practicing engineers involved in press-in engineering worldwide.

With a large number of persons already vaccinated in many countries, some countries are now preparing to open up. When circumstances permit, it is planned that the 15<sup>th</sup> Anniversary celebration of IPA to be held sometime in 2022 can be conducted in hybrid mode (face-to-face and on-line) to facilitate more personal interactions globally and reach out to persons who still cannot travel. The international seminars planned for 2020 will be resumed once the COVID-19 situation is under better control in the host cities. More hybrid events are being planned.

As IPA President, one of my aims is to expand the association to areas beyond technology. Press-in Engineering is well developed in some countries while not so well utilized in other countries. A major concern is on the costing issue. It is planned that new Technical Committees will be set up to provide inputs and reviews on press-in engineering holistically in different parts of the world covering innovation and advancement of machine technology, safety and reduction of time over other existing methods, personnel and management, and cross-country and local budgeting issues. Having a holistic consideration, I trust that press-in engineering technology can be further promoted and developed in the countries yet to utilize press-in technology.

IPA has gone from strength to strength since its founding in 2007. With IPA reaching its 15<sup>th</sup> Anniversary milestone, I sincerely wish that IPA will continue to flourish in many years to come and members can celebrate many more anniversaries in the future.