財團法人 船舶暨海洋產業研發中心
Ship and Ocean Industries R&D Center

船舶暨海洋產業研發中心 40週年紀念專刊

The 40th anniversary special issue

乘風破浪

40週年紀念專刊

The 40th anniversary special issue

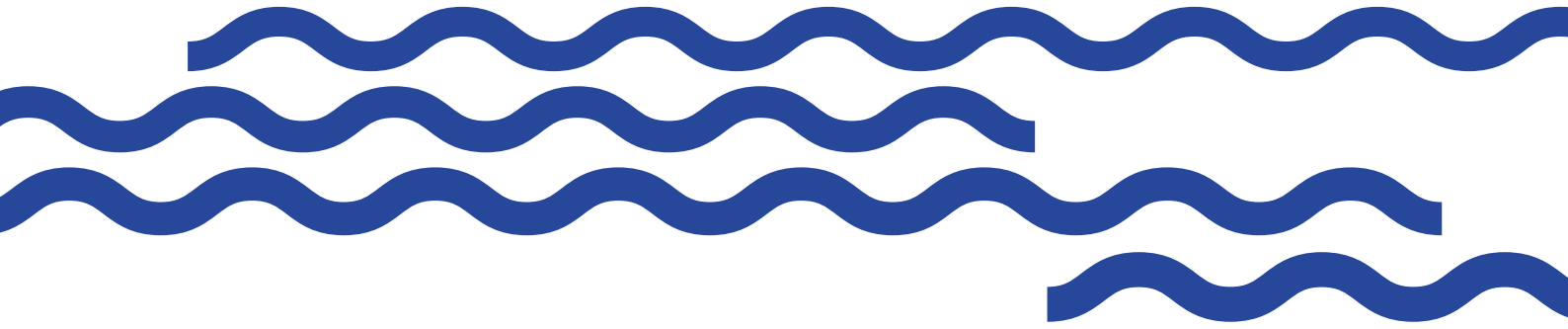
專業 · Professionalism
品質 · Quality
創新 · Innovation
誠信 · Integrity
服務 · Service

SOIC

乘風破浪

40週年紀念專刊

The 40th Anniversary Special Issue



CONTENT






領航臺灣 同步世界

船舶專業前鋒 海洋工程推手

40年來，在臺灣海洋產業的發展歷程中，船舶中心始終扮演著關鍵角色，以船舶設計、研究發展及技術服務，帶領產業鏈不斷升級、累積實力。以專業立足浪尖，船舶中心從臺灣出發，堅持對海洋的熱情，與世界連結！

船舶研發 技術核心

臺灣四周環海，坐擁豐富海洋資源，而種種資源的研究、開發及利用，皆有賴船舶之興造作為基礎，因此造船可謂海洋產業之首。為建立我國自行設計船舶的專業能力，在政府大力支持之下，「財團法人聯合船舶設計發展中心（USDDC）」於民國 65 年（1976）正式成立，隨著業務不斷擴展，從八德路搬遷到基隆大武崙，最後落腳新北市紅樹林現址，並於民國 101 年（2012）轉型更名為「財團法人船舶暨海洋產業研發中心（SOIC，簡稱船舶中心）」，成立至今，堂堂邁入第 40 年。

船舶中心為目前國內唯一具備各種先進船舶與新興海洋研發能量的單位，並以「追求技術卓越立足臺灣」、「放眼亞洲邁向世界市場」、「整合分享塾高產業基礎」及「貢獻國家海洋經濟發展」為重要任務。

40 年來，在研究發展與技術服務取得豐碩成果，於一般商船、客輪、豪華遊艇，以及公務船艦如海巡艦艇、港務船舶、軍用輔助艦艇、海洋研究船等，不僅成功建立自主設計能力，更同步世界水準。

總結船舶中心成果實績，在各型新船的合約設計部分，船廠依合約設計完成 264 艘，共 604 萬載重噸；研究發展部分，持續精進先進船舶技術，如研發模擬化設計、智慧型裝備及各種新型技術；而技術及監造服務部分，則完成新造船或改裝船 470 艘，合計 1,288 萬載重噸。

在全體同仁的戮力合作之下，船舶中心不僅成為國內船舶產業的技術核心，更承擔著臺灣海洋產業的領航重責。

肩負國家安全 引領海洋經濟

「國防自主」是臺灣必須要走的方向，而「國艦國造」政策及「潛艦國造」計畫，更是建立設計開發與維修整補自主能力的重要關鍵。近年船舶中心陸續參與由國人自行規劃、設計、發展與建造的 3,000 噸級海巡署「巡防救難艦」，以及海軍設計建造「海軍迅海級匿蹤飛彈巡防艦」（沱江艦）及「新一代海軍油彈補給艦」（磐石艦），對於政府新近啟動的「潛艦國造」計畫，期能以船舶中心的設計研發能量，透過跨部會合作與產業整合，帶動國內船舶及相關裝備產業鏈的全面提升，並為我國海權打造堅實之防衛力。

「運輸遊憩」與「海洋能源工程」是新興的海洋產業技術領域，因應綠能環保及海洋再生能源利用成為世界趨勢，船舶中心成功研發觀光船艇之綠能動力技術，期能提升國內觀光水域遊憩品質，並應用於其他領域。

此外，船舶中心亦參與政府推動之離岸風力發電計畫，負責研發本土化離岸風機安裝暨維修平台船，以船舶相關技術專業，為綠能開發貢獻己力。

自民國 104 年（2015）上任以來，個人秉持「專業、品質、創新、誠信、服務」5 大信念，為船舶中心掌舵，與執行長密切合作、充分授權，使諸位同仁得以發揮專業，樹立船舶中心成為國內船舶產業之領導權威。

未來更將持續精進研發設計能量，整合資源提供專業服務，共同迎接更新的機會、更高的挑戰，朝世界第一流船舶設計中心的目標大步邁進，開創另一個屬於海洋的黃金時代！SOIC

Lead Taiwan into the World

Pilot the Shipbuilding Industry and Move Ocean Engineering Forward

The SOIC has been playing a key role in developing the Taiwanese marine industry for continuous upgrading and piling up strength with ship design, R&D and technology services since its founding four decades ago. Standing at the fore front of trends in the future, it strives to connect the world with love for the seas around this island.

Ship Development: Core Technology

To study, develop, and employ resources held by the surrounding seas relies on a powerful shipbuilding industry. To build up domestic ship design capacity the “United Ship Design & Development Center” was founded with strong government support in 1976. After 40 years of operations, it moved from Bade Road, Taipei City to Dawulun, Keelung and in Hongshulin New Taipei City where it was transformed and renamed into the “Ship and Ocean Industries R&D Center (SOIC)” in 2012.

The SOIC has been reaping fruitful results of its R&D and technical services since its founding 40 years earlier. It is now well established with independent design talents at the global level in various fields including commercial ships, passenger ships, luxury yachts, as well as special purpose vessels like coast guard patrol boats, harbor management ships, naval supply vessels and research vessels.

To name just a few of its achievements -- Regarding the design of new ships: 264 ships with 6.04 million ton dead weight have been constructed and delivered based on designs contracted by the SOIC; regarding R&D: continuously improving advanced shipbuilding technologies such as simulation-based design, intelligent equipment and other new technologies; regarding technical services and on-site supervision, 470 ships of 1288 ton dead weigh have been built or remodeled.

Thanks to the efforts and devotion of everyone in the SOIC, it is not only becoming the technology core of the domestic shipbuilding industry but also leading the marine industry in Taiwan.

Shoulder Up National Security and Lead Marine Economy

The goal of “Defense Independence” and “Naval Vessel and Submarine by Local Shipyards’s ” policies mandate localized fleet design, development, repair and maintenance capacity. In the past few years, the SOIC has participated in numerous domestic projects including the “CG-129, Maritime Patrol Directorate General Coast Guard Administration” planned, designed, developed and built by domestic institutions and the “Tuo River Class Corvette (Swift Sea)” and the “Panshi Fast Combat Support Ship (AOE-532)” designed and built by Navy Headquarters (Ministry of National Defense).

“Recreational Transportation” and “Ocean Energy Engineering” are the two emerging technical fields in the entire maritime industry. In response to the global trend of green energy and marine renewable energy, the SOIC has successfully developed green energy powered sightseeing cruises to improve domestic ocean sightseeing quality.

In addition, the SOIC has also participated in the “National Offshore Wind Energy Policy” by developing localized platform vessels to install and maintain offshore wind turbines. With its professional skills, the SOIC has contributed greatly to green energy development.

I have been leading the SOIC on the basis of “Profession, Quality, Innovation, Credibility, and Service” since taking this office in 2015. Working together with the CEO I’m devoted to shaping up the SOIC’s leading position in the local shipbuilding industry by creating an environment for every SOIC employee to make the most of his/her talents with full scope of delegation.

In the future, the SOIC will continue to improve its R&D and design capacity, integrating various resources and providing professional services to reach for the goal of becoming the top ship design center in the world.

JIN-YUAN LIU , Chairman

承擔任務　全力以赴

從國艦國造到海洋再生能源

配合國家政策，船舶中心在 40 年的成果基石之上，鎖定發展特種船舶及海洋工程。國艦計畫能強化國防自主能力，離岸風電更為綠色能源趨勢，船舶中心以充沛研發能量，樂於承擔任務、接受挑戰，並且帶領產業航向未來。

船舶中心成立至今，已屆 40 年；計數歲月，個人與船舶中心的淵源，也近 40 年。甫自學校畢業，即受聘至船舶中心協助處理螺槳空化計算問題，並向諸多前輩學習船舶設計實務；服役時擔任造船工程官，負責海軍艦艇性能設計及管控。從事船舶工作多年，對於船舶設計與船舶產業，懷抱著深遠的感情與使命，個人始終堅持，研發必須扣合實際需求、解決實際問題。

懷抱海洋使命　建立自主能力

接任執行長以來，船舶中心業務穩定發展，多項設計專業臻於成熟，尤以商船、公務船舶及各類研究船的設計研發，皆有許多建造量產實績；而海巡艦艇的設計不僅屢獲國內肯定，在國際間亦具有相當之競爭力。為配合國家政策，船舶中心近年業務聚焦鎖定於特種船舶及海洋工程領域，以期建立並深化自主研發能力。

我國軍用艦艇過去多向國外採購，考量國際現實局勢及國防自主需求，殊有必要自行發展設計、建造及裝備產製能力，以免受制。配合政府「國艦國造」及「潛艦國造」政策，船舶中心投入研發相關高科技艦艇技術，協助海軍規劃設計與監造建軍所需的各型船艦，據以帶動國內相關造船產業鏈符合嚴密軍規需求，俾使產業競爭力提升至嶄新層次。對於「潛艦國造」計畫，以國內船舶產業多年累積之專業及發展潛力，相信應能迎接挑戰並開創新局。

發展綠能導向　強化技術能量

為響應民國 104 年（2015）巴黎氣候高峰會對於節能減排的要求，我國承諾民國 119 年（2030）須較民國 94 年（2005）降低 20% 之溫室氣體排放量作為自訂目標。為改善交通船舶之耗油及排碳問題，船舶中心研發油電複合之綠能動力技術，於「2016 台灣國際遊艇展」發表時，廣獲許多國外廠商詢問，而國內重要觀光渡輪亦將陸續採用，以維護環境品質。

海洋再生能源之推動，亦屬有助於溫室氣體減排的範疇，更是具有前景的新興海洋產業。配合政府永續環境的願景，推動千架海陸風力機的政策目標，船舶中心投入協助國內產業建立自升式離岸風電安裝船及離岸風場作業安全評估技術，希冀運用國內良好的風場條件，促成更為環保的綠能發電機制。

過去許多船舶設備或裝備須向國外廠商高價購置，船舶中心特別針對國內此類實務需求進行研發，近期者如「船舶動態定位系統」，能使施工船操作於固定範圍內而不受風浪流影響；許多船廠採用船舶中心與國立臺灣海洋大學共同研發之「新翼型螺槳」後，營業額迅速提升，更有日本廠商反向我國採購，足見品質深獲肯定。

此外，船舶中心與海洋大學所共同研發的「端板螺槳」，已實際應用於許多高值智能船舶之建造，有效提高推進效率及靜音性能，未來將逐步推向國際。在產業夥伴的攜手合作下，民國 105 年（2016）臺灣遊艇世界訂單排名，由第 6 名晉升為第 4 名，展現國內船舶產業強盛實力。

船舶中心將秉持以自身專業，持續優化結構、輔導產業轉型，致力提升產業價值及國際地位，並且聚焦於發展利基型船舶及裝備系統、籌建關鍵核心技術與培育產業人才，以更精實的技術能力，帶領國內廠商搶進國際高端市場，創造臺灣藍海新優勢。SOIC

Give It All to Fulfill the Great Mission

From Indigenous Defense Submarine (IDS) to Marine Renewable Energy

In response to national policies, the Ship and Ocean Industries R&D Center (SOIC) has been standing on a solid foundation that was established over 40 years ago, and continues to perform research and development on special vessels and marine engineering. While “Indigenous Defense Submarine (IDS)” was carried out to reinforce independent national defense, the “Thousand Wind Turbines Project” was enacted to catch up with the latest green energy trends. With abundant R&D resources, the SOIC is willing to undertake great missions, accept various challenges and lead domestic industries to sail toward a brighter future.

Upon graduation, I was immediately hired by the Center to assist with the calculation of propeller cavitation. At the same time, I have also learned from several predecessors about shipbuilding practices and ship-design methods. While serving in the army, I undertook the post of shipbuilding officer and was responsible for naval ship functional design and control. With so many years devoted to the Center, I have gradually cultivated a profound feeling and commitment towards shipbuilding practices, ship-design methods and the entire shipbuilding industry. I personally believe that research and development must be carried out to meet practical demands and resolve practical problems.

Embrace Oceanic Mission to Establish Independent Capabilities

Ever since I took up the post as chief executive officer, SOIC has been developing steadily, with several design technologies becoming all the more mature. While doing research and development on merchant ships, official ships, and research vessels have contributed to several successful shipbuilding cases. Naval ship design has gradually gained global acceptance and praise, further raising domestic shipbuilding competitiveness in the global shipbuilding market. In order to comply with current national policies, the SOIC has been focusing on special ships and marine engineering lately to establish and reinforce independent R&D capabilities on a grander scale.

In the past, domestic naval ships were mainly purchased from aboard. However, due to the current international situation and the demand for independent national defense, there is a necessity for independent R&D, design, shipbuilding and installation in order to break free from multiple international restrictions. To comply with two national defense policies of “Domestic Naval Shipbuilding” and “Indigenous Defense Submarine (IDS)”, SOIC has exerted considerable efforts in high-tech naval ship research and development, assisting naval armies with naval ship construction and supervision, while making sure that domestic shipbuilding industries can meet the strict demands of national marine armies.

Develop Green Energy to Enhance Technical Power

In response to the new demands for energy conservation and carbon reduction generated from the 2015 United Nations Climate Change Conference held in Paris, Taiwan promised to set a goal of reducing greenhouse gas emissions by another 20% from 2005 to the end of 2030. In order to resolve problems in fuel consumption and carbon emissions, SOIC has developed hybrid-electric green technologies, which triggered interest from several foreign firms who attended the “2016 Taiwan International Boat Show”. In addition, hybrid-electric green technologies were successfully applied in domestic sightseeing cruises to maintain overall environmental quality.

The promotion of marine renewable energy is a field that helps reduce greenhouse gas emissions. Aside from that, it is also an emerging ocean industry full of unlimited potentials. In response to the government’s vision of achieving environmental sustainability and the political objective of promoting the “Thousand Wind Turbines Project”, the SOIC has been devoted to helping domestic industries establish self-elevating wind turbine installation vessels (TIV), as well as safety assessment techniques for wind turbine installations. We hope to utilize domestic windmill advantages to develop an even more eco-friendly green power mechanism.

Upholding professional expertise, SOIC will continue to optimize overall structures and promote industrial transition, so that both industrial value and international status can be improved. Furthermore, the SOIC will continue to focus on developing niche vessels and equipment systems, while establishing core technologies and cultivating industrial talents to improve overall technical capabilities. Above all, the SOIC will lead domestic firms in gaining access to global high-end markets and creating “Blue Ocean Advantages” in Taiwan.

YOUNG-ZEHR KEHR, CEO

財團法人船舶暨海洋產業研發中心成立四十週年誌慶

船舶四十
海洋基石

經濟部技術處處長 卓processor 敬題

船舶科技智庫，領航海洋創新，輝煌騰飛四十，再造科研新猷

嘉鴻遊艇呂執行長佳揚

呂佳揚

財團法人船舶暨海洋產業研發中心
四十週年誌慶
聯業興隆通四海
合財茂盛達三江

嘉信遊艇股份有限公司
總經理 龔俊豪 題

船舶中心四十周年誌慶

立足船舶
放眼海洋

台船領總統暨
陳豐almost 敬題

中信造船集團

祝 船舶暨海洋產業研發中心 成立四十周年

功在造船
再創高峰

中信造船集團 總裁 韓碧祥

財團法人船舶暨海洋產業研發中心四十周年誌慶

人才濟濟，專業研發成果豐碩，
惠助產業躋身世界列強。
聲譽卓著，調和鼎鼐產官所仰，
支持政府遂行政策卓著。

臺灣遊艇工業同業公會
理事長 張嘉豪 敬賀

財團法人船舶暨海洋產業研發中心四十週年誌慶

研發創新推手
嘉惠船艇產業

宏昇螺旋槳股份有限公司
鄭正義 題

財團法人船舶暨海洋產業研發中心四十週年誌慶

承先啟後船舶設計興國之股肱
繼往開來海洋創新研發之能量

慶富集團總裁 陳慶男

祝 船舶暨海洋產業研發中心
成立四十周年
四十年來
臺灣船舶暨海洋技術
與產業的領航者

瑞孚宏昌船舶推進系統
股份有限公司 王武雄

慶賀船舶中心四十周年
船舶縱橫汪洋海
中心掌舵鴻圖展
歡慶祝賀輝煌年
四十寒暑功業成

般若科技林允進敬賀

Dear SOIC,

CONGRATULATIONS on celebrating your 40th Anniversary

SOIC, like it's forefather has continued to be Taiwan's Leading Designer of Maritime Structures and Aquatic Devices.

You continue to provide a vital service to the Taiwan's Maritime community.

Great Job! Keep up the Good Work.

Bill Mc Kay

ABS Taiwan

船舶中心成立 40 周年賀詞

欣逢船舶中心成立四十周年，我謹代表法國驗船協會獻上最誠摯的祝賀。
回顧過往，船舶中心對在學的學生而言，是啟蒙的業師。在我就學的年代，船舶中心是最重要的船舶技術實務管道，大學時期的「船舶艤裝」課程是由船舶中心的工程師擔任講師，引領當年的學子進入船舶實務的領域。
對造船產業而言，船舶中心所開發設計的商船、公務船、艦艇、漁船及遊艇等各型船舶記錄了臺灣造船產業的發展歷程。敝會法國驗船協會，也有幸得以參與船舶中心所開發設計的 1100 TEU 貨櫃船、73,000 噸巴拿馬極限型散裝船、582,000 cubic ft 冷凍船，以及 100 噸巡邏艇和 1000 巡邏艦等新船建案，還有其他遊艇及 FRP 船等檢驗認證，見證了船舶中心歷年來對造船產業的貢獻。
對航運業而言，曾經在船舶中心服務的先進，開枝散葉，在各大航運公司及驗船協會擔任重要的職位，是目前航運業界的中堅骨幹。
展望未來，臺灣做為一個海洋國家，無論是在海洋資源的開發利用、或是各型船舶的規劃設計，都更加需要倚重船舶中心專業技術的投入與創新。

祝 船舶中心

開發海洋資源，引領潮流，借力使力
設計創新船舶，乘風破浪，水漲船高

法國驗船協會臺灣分會總經理 吳明昌 敬賀

船舶中心成立四十周年
華路藍縷，國家船舶設計先驅
卓然有成。
任重道遠，台灣海洋產業領航
乘風破浪。

台灣中油公司儲運處 陳傳協 敬賀

船舶暨海洋產業研發中心 誌慶
成立四十周年
船舶是根本立新功
海洋為新創成
產業發心
研中

前執行長 邱逢琰 敬賀

船舶中心四十週年誌慶
風雨同舟四十載
船艦風電任重遠
機會相隨運惟慳
群力共濟爭翱翔

蔡宗亮 敬賀

財團法人船舶暨海洋產業研發中心
四十週年紀念

湛海業成
精四產有
技航惠十
船領嘉四

國立成功大學 特聘教授 方銘 敬題

船舶暨海洋產業研發中心
成立四十週年誌慶

船舶設計整合四十載，可圈可點
海洋產業研發又一章，福國利民

王偉輝 敬賀

船舶暨海洋產業研發中心
成立四十周年誌慶

但進船舶產業發展
績效卓著四十有成

中鋼運通股份有限公司
總經理 陳永雄 敬賀

財團法人船舶暨海洋產業研發中心
成立四十週年紀念

研發高值船舶科技
創新海洋產業技術

國立高雄海洋科技大學
代理校長呂學信 敬賀

船舶產業 精進領先
海洋逐夢 創新思維
卓越技術 四十有成
載重深耕 領航萬年

趙國樑 敬題

為百代承先攜後，
傳承造船工藝技術，
不斷創新再造四十年

黃泰發

DNV 黃泰發

破浪乘風我萬里
協力同心四十年

台大教授 陳義男

專業 Professionalism

臺灣自日據時代開始，便發展出優異的造船技術。民國 65 年（1976）成立、集結國內優異造船人才的「財團法人聯合船舶設計發展中心」，一路走來，不斷汲取世界頂尖的船舶設計、製造，與管理資訊，從觀摩、學習，到擁有自主開發的能力，如今的「財團法人船舶暨海洋產業研發中心」，呈現多元發展的能量。

縱使未來的挑戰不斷，船舶中心用先進的眼光、大膽創新的態度，帶領臺灣造船產業穩健地邁向下一個航海新紀元。

From the start of Japanese Colonial Rule, outstanding shipbuilding technologies have been developed in Taiwan. In 1976, the United Ship Design & Development Center (USDDC), which employs excellent shipbuilding talents, was formally established. For many years, the USDDC has been gathering top ship design, shipbuilding and management information from around the world. From emulating, learning, to acquiring independent developing capability, the SOIC has exhibited great development potentials in various domains.

融合世界潮流 勇於自主創新

平實初衷引領臺灣船舶產業

曾任船舶中心首任總工程師及 5 屆執行長，亦為海洋大學造船創系老師的張達禮教授，娓娓道來臺灣船舶產業的歷史，以及對國際船舶市場的觀察，並提供他的諄諄建言。

海洋大學造船創系教授張達禮。

Professor Da-Li, Chang is the instructor who first established the Department of Systems Engineering & Naval Architecture at National Taiwan Ocean University.

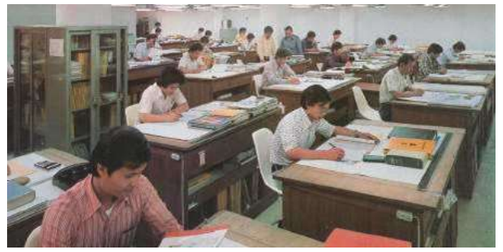
張達禮教授回憶，臺灣在日據時期就具備相當的修船與造船能力，當時基隆、高雄均設有造船廠，光復之後約民國 40 至 50 年間，便開始與日本、歐洲、美國等先進造船國家進行技術合作。「當年在基隆建造的 2 艘 3 萬 6 千載重噸的原油輪，一艘取名為『信仰』（Faith），一艘取名『自由』（Freedom），在當時可是轟動一時，還上了報紙頭條新聞。」談起這段輝煌歷史，高齡 92 歲的張達禮教授依然記憶猶新。

汲取新知提升造船實力

民國 60 年代，國內造船廠亦成功建造出 44 萬 5 千載重噸原油輪，為造船業再創紀錄。然而，考量到當時船舶的圖樣設計、技術與設備，大多必須從國外引進，政府為積極發展造船工業，提升國內造船工業水準，於民國 65 年（1976）成立了船舶中心的前身——財團法人聯合船舶設計發展中心，厚植臺灣自主造船能力，以因應造船、航運業與整體經貿的發展。

40 年來，看到船舶中心為臺灣船舶設計能力打下深厚基礎，在技術、研發與量測等各種服務亦經營有成，張達禮教授欣慰地說：「這都是同仁們齊心合力的成果。」亦認為，船舶這一行是個與時俱進的產業，設計時不能故步自封，應該多觀摩別人怎麼做，參考船東與各研發單位意見，再結合自身技術，勇於嘗試（trial and error），品質才會不斷改善、提高。

「船舶中心剛成立時，我曾到美國參觀世界著名的華盛頓船模試驗水槽，以期為國內日後規劃建造之參考，汲取他們的經驗，臺灣也有許多船舶人才到美國留學後，留在當地發展有成，與這些人才交流，獲取新的發展趨勢。」張達禮教授認為，了解世界各國先進的船舶設計、製造與管理資訊，經過消化吸收，成就自己自主創新的本領，是未來臺灣船舶發展仍應該繼續努力的方向。



40 年來，船舶中心為臺灣船舶設計能力打下深厚基礎，在技術、研發與量測等各種服務亦經營有成。

In the past 40 years, the Ship & Ocean Industries R&D Center has laid a solid foundation for domestic ship design capabilities.

民國70年台大船模實驗人員合照。

The photo of participants in model experiment tank of National Taiwan University was taken in 1981.

與世界潮流並駕齊驅

張達禮教授也提醒，近 50 年來，世界貿易貨物運輸，海運就佔了 95%，不僅航運業大幅擴張，亦直接促成世界商船數量的需求成長，油輪、散裝貨輪、貨櫃船、郵輪等船舶類型發展越來越多元，規模與噸數也急遽增大，逐漸趨向世界水域航道的極限，尤其是民國 65 年（1976）開航、連接太平洋和大西洋的巴拿馬運河，其閘門也已經不足以容納體積愈來愈大的船隻，必須拓建以因應新一代超級貨輪與油輪的需求。

「新巴拿馬運河的增建，對於世界各地航道以及船舶的設計與建造，必定有重大的影響，必須及早注意與因應。」張達禮教授建議船舶中心，要多留意國際船舶的發展趨勢，這也是對所有臺灣從事船舶產業的工作人員的諄諄提醒。

張教授也勉勵大家，無論做事或做人，總歸一句「平實」，「古今任何成功的事業皆如此，萬丈高樓也無不從平地開始。」歷經 40 年歲月，他期許船舶中心能夠一本創立初衷，以平實的態度，面對世界各種新的挑戰，繼續引領臺灣的船舶與海洋產業，邁向更美好的未來。SOIC

Integrated World Trend to Develop Autonomous Innovations

Improve the Taiwan Ship Industry with a Down-to-earth Attitude

Once holding the position of the first chief engineer and 5 terms as executive officer at the Ship & Ocean Industries R&D Center, Chang, Ta-Li was also an instructor who first established the Department of Systems Engineering & Naval Architecture at the National Taiwan Ocean University.

Professor Ta-Li recalls that shipbuilding industries in Taiwan possessed competent ship maintenance and shipbuilding capabilities even when it was under Japanese rule. From 1950 to 1960, shipbuilding industries in Taiwan has begun to build technical collaborative relationships with advanced shipbuilding countries such as Japan, Europe and America.

"In that year, 2 crude oil carriers with 36,000 deadweight tonnage were formally built in Keelung. With one called "Faith" and the other one called "Freedom", the 2 crude oil carriers caused a great sensation and hit the news headline at that time."

In 1970, the domestic shipbuilding yard has successfully established a crude oil carrier with 445,000 deadweight tonnage. Since shipbuilding drawings, techniques and equipment were mainly introduced from aboard, in order to develop domestic shipbuilding industries, the government formally established the predecessor of the Ship & Ocean Industries R&D Center – the "United Ship Design & Development Center" to reinforce domestic shipbuilding capabilities.

Over the past 40 years, the Ship & Ocean Industries R&D Center has laid a solid foundation for domestic ship design capabilities, while various services on techniques, research & development and measurement have all exhibited successful performance results. Professor Chang Ta-li stated that since the shipbuilding industry is stil a developing business, we must constantly learn from others and undergo numerous trials and errors to have overall quality improved and elevated.

"Upon the establishment of the Ship & Ocean Industries R&D Center, I paid a personal visit to the world renowned Washington Navy Yard's Experimental Model Basin. The precious experience gained from this journey can be applied as a reference for domestic shipbuilding projects in the future. In addition, many domestic ship talents have studied aboard and obtained personal achievements in their business careers. By exchanging ideas with these talents, the latest shipbuilding developmental trends can be obtained."

Of all world trade cargo transportation in the past 50 years, sea transportation alone has accounted for 95%. Not only has the shipping industries expanded on a significant scale, the world demand for merchant ships has also grown accordingly. With the increasing ship diversities, scales and deadweight tonnage, the world sea transportation channels are falling short of accommodation capacities.

"The establishment of the Panama Canal is bound to bring significant impact to the design and construction of water channels and ships all around the world. We must pay extra care and make appropriate responses in the early stage," Professor Chang, Ta-li suggested that the Ship & Ocean Industries R&D Center pay close attention to global ship developmental trends.

Professor Chang, Ta-li encouraged everyone to adopt a down-to-earth attitude as a way of life. As an old Chinese saying goes, "The loftiest tower is built up from the ground." Professor Chang Ta-li expects the Ship & Ocean Industries to uphold the business principle and adopt a down-to-earth attitude to confront all kinds of challenges and continue to improve the domestic shipbuilding industry.

菁英群策群力
共同開創藍海

船舶暨海洋產業研發中心簡介

組織架構及核心業務

船舶中心組織架構共分為行政企劃處、船舶產業處、遊艇產業處、海洋產業處、產業服務處等 5 處，及會計室、稽核室等內部單位，另設有「產業發展委員會」。船舶中心以提供船舶工程規劃、工程設計、研究發展、技術服務及知識整合之服務，協助國內外船舶、海洋及相關產業之升級與發展為宗旨，以培植國人自力設計船舶能力為目標。

行政企劃處

下設人資、總務、資訊、企考等組。掌理中心董事會相關事務、規章制度之研擬與建置、人力資源發展、總務、資訊系統之發展與維護、企劃管考業務之規劃與執行、各項政府委辦計畫及一般業務之成案追蹤、管考與行政支援、智財管理與成果推廣，並配合業務發展需要支援技術人力培訓行政工作。

船舶產業處

下設基設、結構、輪機、艤裝、電機、業務等組。掌理船舶與海運產業技術之研發與業務拓展，包含運輸研究、船艦系統設計與工程之研究案及一般業務案之規劃、承攬、建案、執行與管制等業務。

遊艇產業處

下設遊艇、遊憩等組。掌理遊艇與水域遊憩產業之技術研發與業務拓展，包含遊艇遊憩產業技術之研究案及一般業務案之規劃、承攬、建案、執行與管制等業務。

海洋產業處

下設工程規劃、海洋工程、綠能技術、裝備系統等組。掌理裝備系統與綠能產業，及海洋能源與海洋工程產業之技術研發與業務拓展，包含離岸風電及海洋能源開發規劃管理、施工船舶機具、海洋工程、先進裝備系統開發、綠能技術應用之研究案及一般業務案之規劃、承攬、建案、執行與管制等業務。

產業服務處

下設技術服務組及南部辦公室。掌理產業服務推廣與業務拓展。包含產業技術諮詢與服務案之規劃、承攬、建案、執行與管制等業務。

會計室

掌理財務會計政策研擬、年度預決算之彙編、審核、控管預算之執行，及依法令辦理有關會計事務。

稽核室

綜理中心內部稽核工作，中心年度稽核計畫及報告，應向董事會報告，並送監察人。

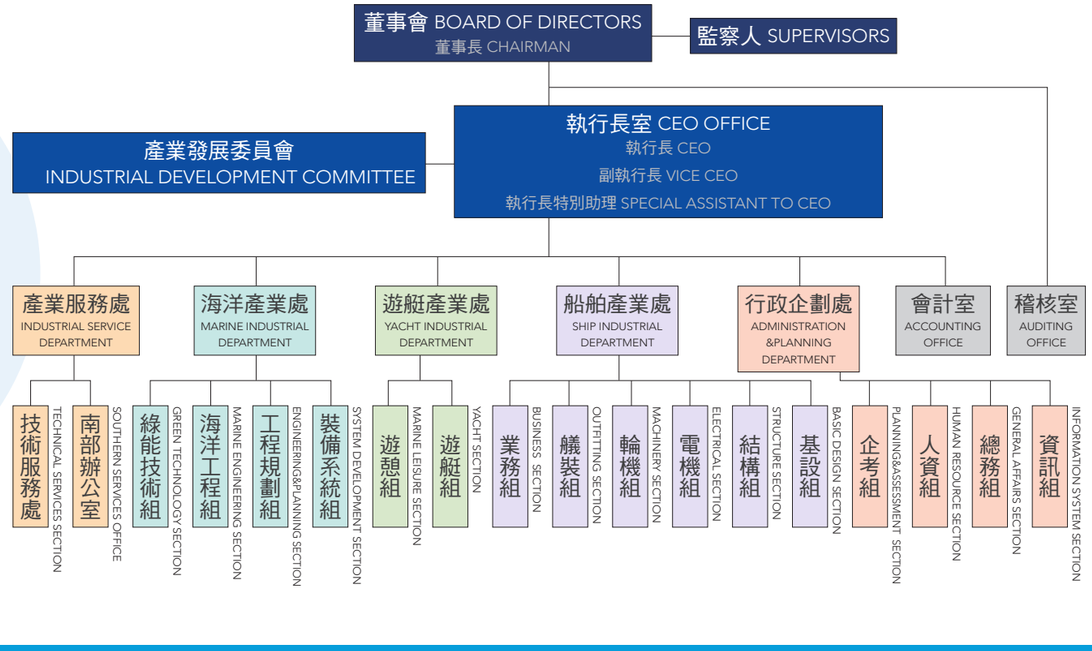
產業發展委員會

為強化與外部產業之聯結及策略研擬、長期業務規劃及重大專案推動等功能，秉承執行長之命，襄助前述事項之執行，並提供諮詢。

組織規劃及人力配置
Organization Chart

至民國 105 年（2016），船舶中心總計 194 人，人員規模為歷來最多。

With a workforce of 194 employees, the SOIC now has the largest ever organization scale.



Organizational Structure and Core Services

The organizational structure of the Ship & Ocean Industries R&D Center (SOIC) can be broken down into 5 departments including “Administration & Planning Department”, “Ship Industrial Department”, “Yacht Industrial Department”, “Marine Industrial Department”, “Industrial Services Department” was also established to achieve the goal of cultivating independent ship design capabilities in Taiwan.

Administration & Planning Department

The Administration & Planning Department can be subdivided into “Human Resource Section”, “General Affairs Section”, “Information System Section”, and “Planning & Assessment Section”.

Ship Industrial Department

The Ship Industrial Department can be subdivided into “Basic Design Section”, “Structure Section”, “Machinery Section”, “Outfitting Section”, “Electrical Section”, and “Business Section”. The department is mainly responsible for ship and ocean industries R&D and business expansion, including transportation research, vessel system design, engineering case study, and general business service planning, subcontracting, establishing, executing, and control.

Yacht Industrial Department

The Yacht Industrial Department can be sub-divided into “Yacht Section” and “Marine Leisure Section”. This department is mainly responsible for yacht and water recreational industries R&D and business expansion, including yachts & recreational technologies research, and planning and general business service subcontracting, establishing, executing, and control.

產官研學合作模式

船舶中心以促進臺灣海洋經濟發展、追求技術卓越、整合並墊高產業基礎為重要任務；依循產業結構優化、帶動產業轉型、提升附加價值、拓展國際地位之執行策略，結合產業界、政府官方、研究單位以及學術單位的資源，共同提升國內船舶及海洋產業之競爭力。

船舶中心與產業界之合作模式，主要為提供設計及技術服務。包含與大型船廠（如台船）合作，建立關鍵技術並拓展國際公務船舶訂單；與中型船廠（如中信、慶富及龍德）合作，建立具國際競爭力之特色節能船舶；與中大型遊艇廠（如嘉鴻、嘉信、高鼎、南海等）合作，建立關鍵技術並精進生產製程；與小型遊艇廠（如松林、隆宜、哥倫、靖海等）合作，運用政府補助資源提升美學與基本設計能力。

與官方（如經濟部）之合作，以提供智庫服務為主，由政府方輔以補助經費，如關鍵技術科專補助、委辦補助計劃等。與研究單位之合作模式為跨領域計畫，如工研院離岸風電產業技術之配合等。與學術單位（如臺灣大學、海洋大學、成功大學）之合作模式則主要為產學合作之輔導、組織關鍵實驗室及研發創新技術，包括船模水槽實驗室、空蝕水槽實驗室及新興海洋能源技術等。

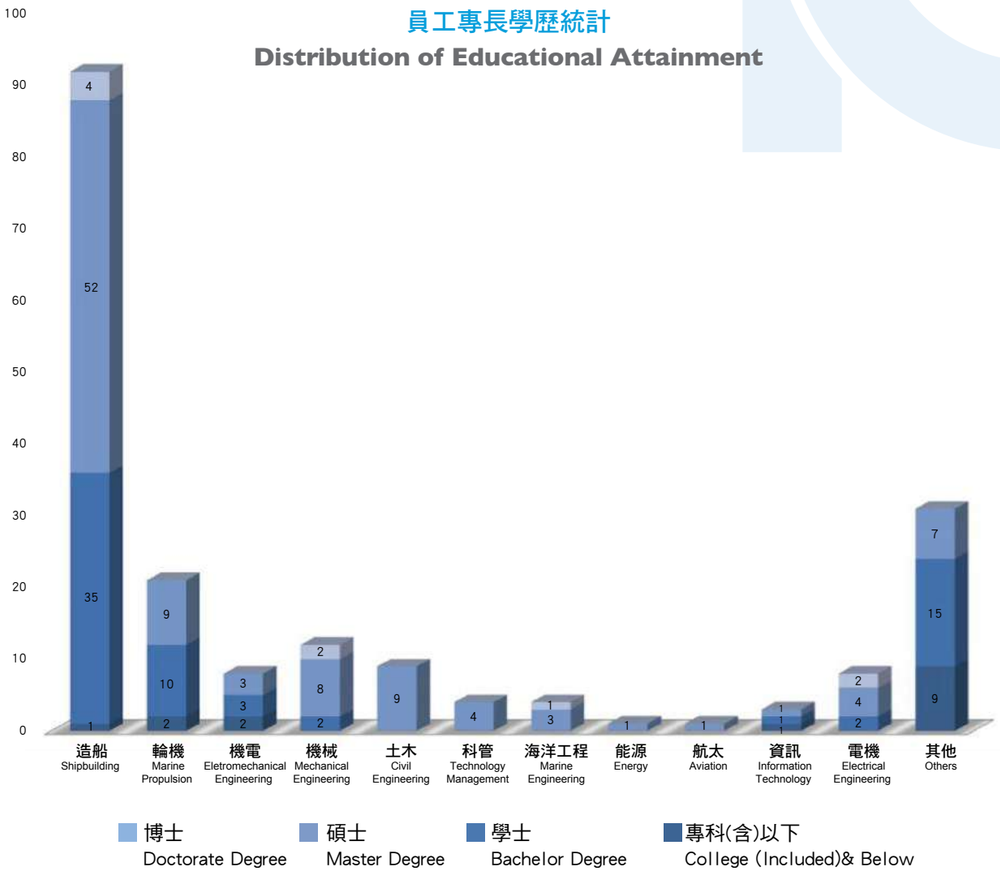
組織發展方向：專案經理制

經過 40 年的努力，船舶中心於一般商船、客輪、豪華遊艇以及公務船艦等，皆已建立自主設計能力並與世界同步，已達成設立時之階段性目標。為強化組織效能，並提高競爭力，船舶中心擬將調整組織架構，以因應國際市場變動趨勢及國內各項實務需求。

船舶中心為改善組織效能，未來擬精簡「處」級，並朝向「專案經理制」發展。未來將逐步由專案經理主動對外爭取業務以增加船舶中心動能，或由船舶中心指派擔任並課以計畫成敗盈虧、協調各組人力之責，作為績效獎懲依據。

期望藉由「專案經理制」之實施，建立權責分明、高度效率的組織架構，進而培養更多具有爭取業務實力的專案經理，同心協力帶動船舶中心迎接新的挑戰。SOIC

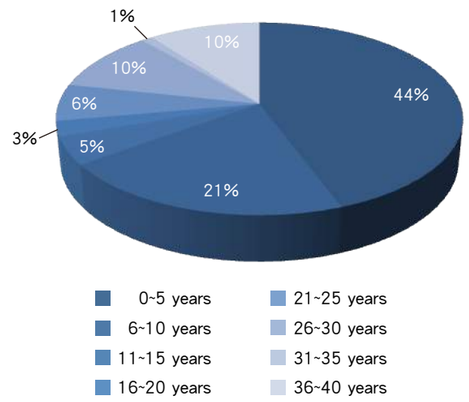
員工專長學歷統計
Distribution of Educational Attainment



年輕活力的成員結構，加以專業堅實的研究能量，是船舶中心的寶貴資產與發展基石。

統計至 105 年 2 月 29 日

年資分析
Seniority Analysis



Marine Industrial Department

The Marine Industrial Department can be subdivided into "Engineering & Planning Section", "Marine Engineering Section", "Green Technology Section" and "System Development Section". This department is mainly responsible for equipment system, green energy, marine energy and marine engineering industries R&D and business expansion, including "offshore wind turbines", "marine resources development, planning and management", "construction vessel machineries", "marine engineering", "advanced equipment system development", "green energy application research" and general business service planning, subcontracting, establishing, executing, and control.

Industrial Services Department

The Industrial Service Department can be sub-divided into the "Technical Services Section" and the "Southern Services Office. The department is mainly responsible for industrial service promotions and business expansion, including industrial technology counseling and service planning, subcontracting, establishing, executing and control.

Industrial Development Committee

The Industrial Development Committee is mainly responsible for "reinforcing connections with external industries", "strategic planning", "long-term business planning" and "major program promotion".

Industrial and Official Collaborative Model

The collaborative model between SOIC and the industrial circle is focused mainly on providing design and technological services, including collaborating with large shipyard such as CSBC by establishing critical technology and expanding international official ship orders, collaborating with medium yacht yards by establishing critical technology and improving manufacturing processes and collaborating with small yacht yards by utilizing government subsidies in elevating aesthetic and basic design capabilities.

The collaborative model between SOIC and the official circle (such as the Ministry of Economic Affairs) is focused mainly on providing consultation services. The collaborative model between SOIC and the research institutions is focused mainly on trans-disciplinary planning, such as complying with offshore wind turbine technologies of ACADEMIA SINICA, developing green vehicle industrial technologies of Automotive Research & Testing Center (ARTC) and official vessel electronic warfare system of the National Chung-Shan Institute of Science & Technology (NCSIST). The collaborative model between SOIC and the academic institutions is focused mainly on providing cooperative education, establishing key organizational laboratories and developing innovative technologies, including ship model basin laboratories, cavitation tunnel laboratories and emerging marine energy technologies.

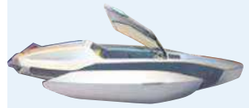
Organizational Development Direction: Program Management System

In order to improve organizational efficiency, the SOIC will simplify the current "departmental" grades into "program management systems". In the future, program managers will fight for external business opportunities to increase SOIC dynamics.

By establishing a well-defined and highly-efficient organizational structure, more program managers with business opportunities seeking capabilities will be cultivated to lead SOIC to a brighter future.

獲獎實績 Success Story

德國 iF 產品設計獎 iF Product Design Award



水上水下穿梭艇 Sigma Shuttle

水上水下穿梭艇未來與大型遊艇結合，可長程移動至定點後進行穿梭海平面之航行，為新型態跨界移動概念遊樂用交通工具，開拓海洋休閒活動新界線，探索奧妙深藍世界。

The Sigma Shuttle combines the planar dimension of ships with the longitudinal mobility of a submarine to deliver a new concept in marine transportation.

三胴體潛海觀景船 C-Cross Trimaran

C-Cross Trimaran 打破一般遊艇局限於海平面 XY 向度移動的範圍，C-Cross 以三胴體船型結構特性做型態的變化，藉由變化的「海底探潛模式」及「海面瞭望模式」作不同情境功能需求的切換。

The C-Cross Trimaran is now pending for international patent filing. The C-Cross Trimaran is now pending for international patent filing. The C-Cross Trimaran is now pending for international patent filing.

水陸兩用車 Jetfoil Bus

Jetfoil Bus 之設計是結合擁有高速特性的水翼船及路上載運乘客的巴士，並擁有特殊設計的逃生座椅，兼顧方便、速度與安全的新世代休閒觀光水陸運輸工具。

This is now combined in a critical project “Multi-function and energy saving shipbuilding technology development” for further advancement.

美國 IDA 產品設計銀牌獎 IDA Silver Award

水動力發電機 Hydro Generator

放流式水力發電機透過錨定之船舶或海上平台，將海水流力轉換為電能供船舶或其他設備應用，運用船舶中心之獨特螺獎設計，將大幅提升海流動能轉換至旋轉動能之效率，迷你型的發電裝置施放與回收容易，具高機動性。

The flowing water based generator converts the flowing force of seawater into electricity to power ships or other devices. The SOIC exclusive propeller design boosts sea current kinetic energy into rotational one.

英國皇家造船工程師學會 RINA 獎 RINA Award

冷凍冷藏船 626,000 CUFT Reefer Vessel

本冷凍冷藏船榮獲 RINA 2002 年傑出船型。由希臘船東委託中心設計，為多層甲板設計，於甲板上放置冷凍貨櫃，貨船內為冷藏貨物。為節省運輸時間，於舷側門設計活動棚架，俾利雨天亦能裝卸貨物。

This reefer ship, contract designed by SOIC for a Greek shipowner, won the RINA outstanding ship form award in 2002. With a multi-deck for reefer containers and a reefer cargo hold, this vessel features a mobile canopy frame at the broadside door for cargo loading and unloading even on rainy days.

超巴拿馬型貨櫃船 5,714 TEU Container

榮獲 RINA2004 年傑出船型獎。本船為國內首次自行規劃設計建造之超巴拿馬型貨櫃輪，由東方海運委託台船公司建造，由船舶中心規劃設計。

A year 2004 RINA excellent ship form prize winner, this Panamax container vessel was contracted by OOCL to SOIC and CSBC for planning and design. Almost equivalent to the OOCL California, winner of the same prize in 1995, this successor comes with more deck load capacity for improved cargo load factor.

年度船舶、遊艇獎 Annual Ship and Yacht Award

達和輪 Ta-Ho Maritime（13,600 噸自卸式散裝水泥船）

榮獲民國 94 年（2005）第一屆年度船舶獎，由台船公司承造、船舶中心設計。為國人設計全球首艘電力推進散裝水泥專用船。設計上，整合了推進系統及裝卸貨系統動力，增加可裝貨空間，亦獲得 RINA 年度傑出船型，足為國人共同的榮耀。

Designed by the SOIC and built by CSBC, the Ta-Ho cement bulk ship(13,600 ton auto-unload bulk cement ship) won the first annual ship design award in 2005. Being the first domestically designed electrically propelled cement bulk ship which integrates both propulsion and loading and unloading system power into one by a power generator. Being the first domestic designed electric propelled cement bulk ship integrates both propulsion and loading and unloading system power into one by power generator.

南投艦（CG-122）500 ton Marine Frigate

榮獲民國 97 年（2006）第二屆年度船舶獎，由中信造船公司承造、船舶中心設計。為國人自行設計建造之最大型海洋巡防艦，配備造船廠自行研發艉滑道、船體結構採用浮動地板，以及國人自行研發穩定翼系統，具有優異耐波穩定性。

Designed by the SOIC and built by the JSSC, the Nantou marine frigate won the second annual ship design award in 2006. The Nantou is the largest marine frigate designed and built locally. In addition to the stern ramp developed by the JSSC, it also employs floating floors and vibration suppression steel plates in the engine room for noise control as well as a domestically developed fin stabilizer for excellent seakeeping stability.

YM UBERTY

榮獲民國 98 年（2009）第五屆年度船舶獎，由台船公司承造、船舶中心設計。本輪型為國內首艘大型 8,000 TEU 以上之貨櫃輪，使國內造船工業邁入具有開發、設計及建造 8,000 TEU 級超大型貨櫃船技術之國家。

Designed by the SOIC and built by CSBC, the YM Uberty container ship won the fifth annual ship design award in 2009. YM Uberty was the first container ship with a capacity greater than 8000 TEU built in Taiwan. It boosted the domestic shipbuilding industry into the field of 8000 TEU container ship development, design and building.

台南艦（CG-126）200 ton Marine Frigate

榮獲民國 100 年（2011）第七屆年度船舶獎，由中信造船公司承造、船舶中心設計。本船採雙可控螺距俥葉配合大型化的雙舵設計，佐以艏側推器，具備穩定翼及減搖水櫃，耐海性能佳，機艙無人化的設計可減低海巡執勤人員的人力需求。

Designed by the SOIC and built by JSSC, the CG126 won the seventh annual ship design award in 2011. Featuring dual controllable pitch propellers, dual large rudders and bow thruster, the CG126 is excellent in hull maneuverability. The stabilizer fin and anti-rolling tank enable good sea keeping along with post-crash survival safety. The unmanned engine room also cuts the head count in the Coast Guard Organization.

海研五號 RV Ocean Research 5

榮獲民國 102 年（2013）第九屆年度船舶獎，由中信造船公司承造、中信造船公司、船舶中心設計。本船的特殊船艏聲納罩設計、電力管理系統與船舶動態定位系統、主發電機安裝於雙層避振底座、模組化實驗設施規劃，皆為創新且優秀技術。

Designed by the SOIC and built by JSSC, the RV OR5 won the 9th annual ship design award in 2013. Featuring innovative and excellent techniques including special bow sonar cover, power management system, vessel dynamic positioning system and a main generator located at double-layered shock absorption base and modularized lab facilities.

磐石軍艦（AOE-532）Panshi Fast Combat Support Ship

榮獲民國 105 年（2016）第十二屆年度船舶獎，由台船公司承造；海發中心、船舶中心、台船公司設計，自設計至建造完工，均由國人自力完成。本船是海軍現役排水量最大的船艦。設計納入性別平等、環保法規、人道、醫療救援及人因工程等設計規劃，積極扮演人道援助提供者的任務。

Designed by Naval Shipbuilding Development Center, SOIC and CSBC and built by CSBC, the AOE-532 won the 12th annual ship design award in 2016. The Panshi is the vessel with the largest displacement in ROC’s naval fleet. Its design has taken gender equality, environmental regulations, humanitarian, medical aid and human factors engineering into account for humanitarian assistance provision.

SONEVA IN AQUA 64

榮獲民國 100 年（2011）第七屆年度遊艇獎，由大洋遊艇公司承造；船舶中心、葉大成造船技師事務所設計。本船通過法國 BV 入級檢驗，具有無限制航行水域之穩度與結構安全性，國內帆船首次獲得類似的殊榮。

Designed by SOIC and eRich Naval Architect & Yacht Design, built by Tayana Yachts, the SONEVA IN AQUA 64 has won the 7th annual yacht prize. Winning the BV grade certification makes it the first sailboat made in Taiwan that features stability and structural safety for sailing in any water bodies.

民國 65 ～ 71 年

●**民國 65 年 7 月：**民國 63 年我國旅美學人組成的造船工程學社上書當時的行政院長 蔣經國先生，提出我國應培養自行設計船舶的能力，並在當年 7 月舉辦的「近代工程技術討論暨國家建設研討會」中，建議成立全國性的船舶設計中心，得到政府的支持，於是由厲汝尚博士建立籌備處，位於台北市八德路 3 段 20 號台資大樓 6 樓，65 年 7 月 1 日船舶中心正式成立。

●**民國 65 年 12 月：**自力全程完成我國第一艘船型為 6,100 載重噸木材船之設計案，獲得 16 艘訂單，由中船公司建造，入級 CR，於民國 67 年 10 月起陸續交船，臺灣的造船業正式擺脫對國外船舶設計之依賴。

●**民國 71 年 7 月：**配合中船設計美國艾索 (ESSO) 石油公司 87,700 載重噸油輪訂單，陸續共計建造 4 艘，本設計為當時最新符合 MARPOL 之省能源型油輪，具機艙無人化全自動控制及船艉部螺槳前端加裝節能導筒等特點。

1976 ～ 1982

- **Jul. 1976:** The preparatory office of "United Ship Design & Development Center (USDDC)" was first established. With active support and promotion from the government, the preparatory office of the United Ship Design & Development Center (USDDC) was first established in the Tai Zi Office Building, with Dr. Li, Ju-Shang holding the post of the "Preparatory Office Director". On Jul 1st, 1976, USDDC was formally established.
- **Dec. 1976:** The USDDC independently completed a design project of the first domestic log carrier (6,100 DWT).
- **Jul. 1982:** The USDDC assisted the CSBC with the design of 87,700 DWT Oil Tanker with which ESSO had entrusted CSBC. The oil tankers were the most energy efficient models that met with the MARPOL standards at that time.

民國 72 ～ 83 年

●**民國 72 年 7 月：**船舶中心設計我國首艘巴拿馬極限型 66,000 載重噸散裝貨輪交船，後續由中船共計建造 11 艘，分屬國內益利、陽明、中航、益壽、遠東、遠通、裕民等 7 間大型航運公司。

●**民國 79 年 6 月：**海軍委託設計 9,300 載重噸油彈補給艦「武夷艦 AOE-530」完成交船，本艦採雙機雙俥推進系統，左右兩舷有補給站，船艉有直升機甲板，具海上整補與垂直整補功能，滿載排水量達 17,000 噸。

●**民國 81 年 10 月：**購置高雄市中正二路連絡處辦公室。

●**民國 81 年 12 月：**辦公室遷至基隆大武崙自購之住辦大廈。

●**民國 83 年 11 月：**船舶中心受中國石油公司委託設計，並由中船高雄廠建造 260,000 載重噸油輪，此型船為我國首度設計建造之巨型超級油輪 (VLCC)，規劃有 14 個貨油艙與 3 組貨油泵系統操作，機艙採無人化全自動控制。

1983 ～ 1994

- **Jul. 1983:** A 66,000 DWT Panamax Bulk Carrier designed by the USDDC was formally delivered.
- **Jul. 1990:** The USDDC had designed AOE-530, a 9,300 DWT Combat Support Ship with which the Republic of China Navy (ROCN) had entrusted the center.
- **Oct. 1992:** The contact office was formally purchased and established at Zhong Zheng 2nd Rd of Kaohsiung City.
- **Dec. 1992:** The office was relocated to a self-purchased residential and commercial complex at Tapurun of Keelung City.
- **Nov. 1994:** The USDDC had designed a 260,000 DWT Oil Tanker with which CPC Corporation had entrusted the center.

民國 84 ～ 89 年

●**民國 84 年 1 月：**船舶中心因應海防救難任務需求，首次設計 100 噸級警巡艇交船，此船型自保七總隊、水上警察局至今日海巡署興建之新一代艇中，已建造完成 29 艘，為海巡署近岸主力艦艇。

●**民國 86 年 6 月：**與海發中心共同規劃設計 500 噸級近岸巡邏艦原型艦「錦江艦」，並完成建造，為我國第一次自製建造的 500 噸級軍艦，共計建造 12 艘。

●**民國 87 年 6 月：**配合中船承接丹麥船東 A.P. Moller 設計之首艘 1,092 TEU 貨櫃船，共計建造 10 艘。

●**民國 88 年 2 月：**船舶中心運用經濟部科專引進美國 TPI 公司「複合材料樹脂注入式成型法 (SCRIMP ™)」專利技術，並移轉研究成果至國內 4 家遊艇廠，成功協助國內遊艇廠邁向巨型遊艇建造之林。

●**民國 89 年 9 月：**船舶中心配合中船承接香港東方海外航運公司 5,500 TEU 貨櫃船首艘設計案，共計建造 2 艘，本船為國內首次設計建造之超巴拿馬極限型貨櫃船，榮獲 RINA 2004 年傑出船型獎。

1995 ～ 2000

- **Jan. 1995:** Police patrol vessel (with 100 DWT) was first designed and delivered.
- **Jun. 1997:** PG-603, a 500 DWT Coastal Patrol Ship jointly designed by the USDDC and Naval Shipbuilding Development Center, was formally built.
- **Jun. 1998:** The USDDC had assisted CSBC with the design of 1,092 TEU Container Ship, with which A.P. Moller had entrusted CSBC. A total of 10 such container ships were formally built and delivered at CSBC Keelung Shipyard.
- **Feb. 1999:** Through "Industrial Technology Development Program" promoted by Ministry of Economic Affairs (MOEA), the USDDC had introduced a patented technology "Seemann Composites Resin Infusion Molding Process (SCRIMP™)" from TPI.
- **Sep. 2000:** The USDDC had assisted the CSBC with the design of 5,500 TEU Container Ship, with which Orient Overseas International Limited (OOIL) had entrusted CSBC. The container ships were the first Panamax container ships designed and built in Taiwan.

民國 90 ～ 98 年

●**民國 90 年 3 月：**船舶中心為海巡署設計之 500 噸級巡邏船「台北艦」交船，後續姐妹艦為「南投艦」於民國 94 年交船，本船獲得 2005 年度臺灣船舶獎。

●**民國 91 年 10 月：**船舶中心辦公室自基隆遷到淡水安泰登峰大樓。

●**民國 93 年 3 月：**為強化創新研發能力，因應產業環境變遷，船舶中心實施組織再造，調整組織架構與功能。

●**民國 97 年 5 月：**船舶中心運用經濟部科專研發成果，與台船配合，為陽明航運公司設計 8,236 TEU 貨櫃船，是國內首艘 8,000 TEU 以上之大型貨櫃輪，亦為國內造船界首次採用 HT40 高張力鋼板之船隻，共計建造 10 艘，榮獲 2008 年 RINA 傑出船型及 2009 年度台灣船舶獎。

2001 ～ 2009

- **Mar. 2001:** CG116, a search and rescue vessel (with 500 deadweight tonnages) was designed and delivered to Coast Guard Administration.
- **Oct. 2002:** Our office was relocated from Keelung City to An Tai Deng Feng Building at Tamsui District.
- **Mar. 2004:** In order to reinforce our innovative R&D capability, organizational restructuring was facilitated.
- **May. 2008:** Through the Science and Technology Development Plan promoted by Ministry of Economic Affairs (MOEA), the USDDC had assisted CSBC with the design of 8,236 TEU Container Ship, which Yang Ming Marine Transport Corporation had entrusted CSBC with.

民國 65～71 年（1976～1982）

民國 65 年 7 月 蔣堅忍先生擔任第一屆董事長、厲汝尚博士擔任總經理 (70 年 3 月改稱執行長)。
民國 68 年 7 月 蔣堅忍先生擔任第二屆董事長、厲汝尚博士擔任總經理。
民國 71 年 7 月 蔣堅忍先生擔任第三屆董事長、厲汝尚博士擔任執行長。

On Jul. 1976, Mr. Chieh-Jen Chiang, assumed the position as the first chairman of the board, and Dr. Ju-Shang Li assumed the general manager. (CEO after Mar. 1981)
On Jul. 1979, Mr. Chieh-Jen Chiang, assumed the position as the second chairman of the board, and Dr. Ju-Shang Li assumed the general manager.
On Jul. 1982, Mr. Chieh-Jen Chiang, assumed the position as the third chairman of the board, and Dr. Ju-Shang Li assumed the CEO.

民國 72～83 年（1983～1994）

民國 74 年 7 月 韋永寧先生擔任第四屆董事長、厲汝尚博士擔任執行長。
民國 77 年 7 月 韋永寧先生擔任第五屆董事長、張達禮先生擔任執行長。
民國 80 年 7 月 韋永寧先生擔任第六屆董事長、張達禮先生擔任執行長。
民國 83 年 7 月 羅錡先生擔任第七屆董事長、張達禮先生擔任執行長。

On Jul. 1985, Mr. Yung-Ning Wei, assumed the position as the fourth chairman of the board, and Dr. Ju-Shang Li assumed the CEO.
On Jul. 1988, Mr. Yung-Ning Wei, assumed the position as the fifth chairman of the board, and Mr. Ta-Li Chang assumed the CEO.
On Jul. 1991, Mr. Yung-Ning Wei, assumed the position as the sixth chairman of the board, and Mr. Ta-Li Chang assumed the CEO.
On Jul. 1994, Mr. Chi Lo, assumed the position as the seventh chairman of the board, and Mr. Ta-Li Chang assumed the CEO.

民國 84～89 年（1995～2000）

民國 86 年 7 月 李英明先生擔任第八屆董事長、張達禮先生擔任執行長。
民國 89 年 7 月 陳義男博士擔任第第九屆董事長、張達禮先生擔任執行長。

On Jul. 1997, Mr. Ying-Ming Li, assumed the position as the eighth chairman of the board, and Mr. Ta-Li Chang assumed the CEO.
On Jul. 2000, Dr. Yi-Nan Chen, assumed the position as the ninth chairman of the board, and Mr. Ta-Li Chang assumed the CEO.

民國 90～98 年（2001～2009）

民國 92 年 7 月 陳義男博士擔任第第十屆董事長兼執行長。
民國 95 年 2 月 董事長陳義男博士辭兼執行長，黃正利副執行長暫代執行長。
民國 96 年 1 月 陳義男博士擔任第十一屆董事長，黃正利先生擔任執行長。
民國 97 年 1 月 陳義男董事長退休，黃正利先生擔任第第十一屆董事長兼執行長。

On Jul. 2003, Dr. Yi-Nan Chen, assumed the position as the tenth chairman of the board and the CEO.
On Feb. 2006, Dr. Yi-Nan Chen resigned CEO, deputy CEO Cheng-Li Huang took up the CEO position for an interim period.
On Jan. 2007, Dr. Yi-Nan Chen, assumed the position as the eleventh chairman of the board, and Mr. Cheng-Li Huang assumed the CEO.
On Jan. 2008, Dr. Yi-Nan Chen, chairman of the board retired and Cheng-Li Huang, CEO, took up the chairman position for an interim period.

民國 99～100 年

●**民國 99 年 11 月：**船舶中心運用經濟部科專研發成果，為海巡署規劃設計 2,000 噸級巡防艦「台南艦」，榮獲 2010 年度台灣船舶獎，後續姐妹艦「新北艦」亦於 101 年 12 月交船。

●**民國 99 年 11 月：**船舶中心為海巡署規劃設計之 1,000 噸級漁業巡護船「巡護七號」順利交船，後續 2 艘姊妹艦「巡護八號及巡護九號」亦陸續於 101 年底及 102 年初交船。

●**民國 100 年 2 月：**交通部觀光局日月潭國家風景區管理處委由船舶中心設計監造之綠能巡邏艇日月潭二號下水啟航。

●**民國 100 年 6 月：**配合政策推動舉辦 2011 海峽兩岸運輸船之研討會。

●**民國 100 年 10 月：**船舶中心運用經濟部科專研發成果，執行海軍光華六號飛彈快艇監控系統案，共計成功協助 30 艘飛彈快艇進行監控系統之建置工作。

2010～2011

- **Nov. 2010:** Through "Industrial Technology Development Program" promoted by Ministry of Economic Affairs (MOEA), the USDDC had designed and delivered CG-126, a 2,000 DWT Frigate that the Coast Guard Administration had entrusted the center with.
- **Nov. 2010:** Fisheries Patrol Boat VII, a 1,000 DWT fisheries patrol boat that the Coast Guard Administration had entrusted the center with, was designed and delivered.
- **Feb. 2011:** Sun Moon Lake II, a green powered patrol boat was supervised, constructed and formally launched.
- **Jun. 2011:** In response to government policy, 2011 Cross-Strait Carrier Seminar was held.
- **Oct. 2011:** Through the Science and Technology Development Plan promoted by Ministry of Economic Affairs (MOEA), the SOIC had executed Kuang Hua VI (FACG-60) Monitoring System Project, with CSBC held responsible for the monitoring system construction.

民國 101 年

●**民國 101 年 2 月：**獲經濟部核准更名為「財團法人船舶暨海洋產業研發中心」，舉行更名揭牌儀式，當日與會貴賓產、官、學、研界等代表近百人，並蒙經濟部施顏祥部長親臨主持揭牌儀式。

●**民國 101 年 3 月：**船舶中心規劃設計海巡署新 1,000 噸級巡防救難艦 4 艘建造案，高鼎船廠得標承建，首艘 104 年 6 月交船，最後一艘之交船期則為 105 年 6 月。

●**民國 101 年 8 月：**船舶中心舉辦「離岸風場開發技術引進計畫」會議，邀請工業局、工合辦公室、美商洛馬公司、英國 TWI 公司與丹麥 NIRAS 公司等單位參與，並主辦民國 101 年「離岸風電海事工程發展聯盟」成立大會，會中由永傳能源、中鋼公司、台船公司、中國驗船中心等與船舶中心簽署五方協議合作意願書。

●**民國 101 年 8 月：**國研院委託船舶中心規劃設計及監造，由中信造船廠建造的 2,700 噸級「海研五號」於 101 年 8 月 10 日上午在高雄光榮碼頭舉行啟用典禮。

2012

- **Feb. 2012:** The center was originally named as "United Ship Design & Development Center (USDDC)". With official admission from the MOEA, the old name was formally replaced with a new one "Ship and Ocean Industries R&D Center (SOIC)" An unveiling ceremony hosted by Minister of Economic Affairs Shih Yen-shiang was formally held, with approximately a hundred people from industrial, political, academic, and R&D circles invited over to participate in the grand event.
- **Mar. 2012:** Coast Guard Administration has entrusted us with the planning and design of the construction project on 4 search and rescue vessels (with 1000 deadweight tonnages).
- **Aug. 2012:** A seminar on "Offshore Wind Power Policy & Development in Taiwan" was formally held by SOIC, with Industrial Development Bureau, Taiwan-USA Industrial Cooperation Promotion Office, Lockheed Martin (the U.S.), TWI (British), NIRAS (Denmark) invited over to participate in the grand event.
- **Aug. 2012:** National Applied Research Laboratories has entrusted us with the design and supervision of RV OR5.

民國 102 年

●**民國 102 年 1 月：**臺北翡翠水庫管理局，由船舶中心規劃設計及監造之「翡翠綠能壹號」多功能載客電動船下水交船。

●**民國 102 年 2 月：**日月潭水域第一艘以全電力推進的民營遊船「國益 2 號」完成下水試俥。

●**民國 102 年 4 月：**行政院農業委員會水產試驗所委託船舶中心規劃設計、審圖及監造之「300 噸級多用途漁業試驗船—水試二號」於三陽造船公司舉行交船典禮。

●**民國 102 年 11 月：**船舶中心配合政府政策推動完成國內第一具底碇式水下環境監控系統，於福海風場實施海域佈放。

●**民國 102 年 11 月：**船舶中心配合政府執行日月潭載客船舶電動化政策，協助日月潭汰建綠能電動船艇—哲園六號、鳳凰號。

●**民國 102 年 12 月：**船舶中心協助高雄愛河新建綠能電動船艇，共計完成新建 12 艘。

●**民國 102 年 12 月：**船舶中心運用科專研發成果為日月潭船東開發綠能電動遊艇—大粧一號完成下水交船，使用直流快速充電系統，為全國首艘配置直流快速充電之遊艇。

2013

- **Jan. 2013:** Feitsui Green Power I was formally launched.
- **Feb. 2013:** Operational acceptance testing was completed for Sun Moon Lake II.
- **Apr. 2013:** Fisheries Research II, a fisheries research vessel Fisheries Research Institute, COA, Executive Yuan has entrusted us with, was built.
- **Nov. 2013:** In response to government policy, the first domestic ocean-bottom marine environment monitoring system was formally installed.
- **Nov. 2013:** The SOIC assisted Sun Moon Lake with the construction of the two green powered motorized shuttle boats, LEALEA GARDEN VI and PHOENIX.
- **Dec. 2013:** The SOIC have assisted Kaohsiung City Government with the construction of 12 green powered boats at Love River of Kaohsiung City.
- **Dec. 2013:** The SOIC had developed Da Zhuang I, a green powered electric yacht. By the end of 2013, the green powered electric yacht was formally launched and delivered.

民國 103 年至今

●**民國 103 年 5 月：**船舶中心首次分別於南北兩地，辦理船舶產業新進人員訓練課程，為產業界培植相關人才。

●**民國 103 年 12 月：**船舶中心運用科專研發成果，與海發中心、台船公司共同規劃設計之「沱江級飛彈巡邏艦—沱江艦 PGG-618」建造完成，本艦為具雷達匿蹤功能之穿浪型雙船體型巡邏艦。

●**民國 104 年 1 月：**運用科專研發成果與海發中心、台船公司共同規劃設計之「快速戰鬥支援艦—磐石艦 AOE-532」建造完成，為我國自製建造的新一代油彈補給艦，亦是海軍目前最大的軍艦。

●**民國 104 年 2 月：**船舶中心運用科專成果為海巡署規劃設計 3,000 噸級之最大噸位巡防救難艦，宜蘭艦與高雄艦為國內設計建造巡防救難艦實績中之重要里程碑。

2014～NOW

- **May. 2014:** The SOIC first provided newly-recruited educational and training courses at northern district and southern district, respectively.
- **Dec. 2014:** The SOIC had joint force with Naval Shipbuilding Development Center and CSBC to design and build the Tuo River Class Corvette PGG-618.
- **Jan. 2015:** The SOIC had joint force with Naval Shipbuilding Development Center to design and build the Panshi Fast Combat Support Ship (AOE-532).
- **Feb. 2015:** The SOIC had designed 3,000 DWT CG-128 and 3,000 DWT CG-129, which had become an important milestone for the design and construction of domestic search & rescue ship.

民國 99～100 年（2010～2011）

民國 99 年 1 月 黃正利董事長擔任第第十二屆董事長。
民國 99 年 7 月 黃正利董事長教授請辭董事長職，蔡宗亮博士擔任第十二屆董事長，邱逢琛博士獲聘第十二屆執行長。

On Jan. 2010, Mr. Cheng-Li Huang, assumed the position as the twelfth chairman of the board.
On Jul. 2010, Mr. Cheng-Li Huang resigned chairman of the board, Dr. Tsung-Liang Tsai assumed the position as the twelfth chairman of the board, and Dr. Feng-Chen Chiu was elected as the CEO.

民國 101 年（2012）

民國 102 年（2013）

民國 102 年 7 月 邱逢琛執行長期滿歸建臺灣大學，由蔡宗亮擔任第十三屆董事長兼任執行長。
民國 102 年 9 月 經過公開遴選，柯永澤博士獲聘船舶中心第十三屆執行長。

On Jul. 2013, Dr. Feng-Chen Chiu returned to National Taiwan University. Dr. Tsung-Liang Tsai, assumed the position as the thirteenth chairman of the board and the CEO.
On Sep. 2013, Dr. Young-Zehr Kehr, was elected as the CEO.

民國 103 年至今（2014～NOW）

民國 104 年 1 月 劉金源博士擔任第十三屆董事長。
民國 105 年 1 月 劉金源博士擔任第十四屆董事長、柯永澤博士續聘為執行長。

On Jan. 2015, Dr. Jin-Yuan Liu assumed the position as the thirteenth chairman of the board.
On Jan. 2016, Dr. Jin-Yuan Liu continued to be appointed as the fourteenth chairman of the board, and Dr. Young-Zehr Kehr re-elected as the CEO.

服務 Service

造船乃高成本、高精密技術的產業。每一艘船能夠順利下水、穩定航行於海上，背後仰賴的是縝密且專業的規劃與製造能力。

船舶中心從設計商船起家，領域拓展至公務船、研究船、軍艦等，滿足各式航海需求，提供造船業者專案、客製化的協助。此外，船舶中心更與時俱進，在觀光遊憩的領域也有亮眼成績，展現靈活多變的設計能量。

穩定經濟，也鞏固國防實力，仰賴船舶中心豐富的經驗，臺灣「國艦國造」不再只是夢想與口號，一切都將指日可待。

Shipbuilding is intrinsically a cost and technology -intensive industry. Behind each successful ceremonial ship launch is the professional and careful planning as well as intensive shipbuilding capabilities.

The Ship and Ocean Industries R&D Center (SOIC) started out designing merchant ships, with its service scope gradually expanding to include official ships, research vessels and warships to meet all kinds of sailing demands and provide each shipbuilder with personalized and customized service. In addition, the SOIC also keeps pace with the times by exhibiting flexible and diversified design capacity in the sightseeing and recreational fields.

In stabilizing the economy and consolidating national defense capability, a domestic shipbuilding program is no longer a dream or a slogan with the assistance of SOIC. It is a dream come true in the days to come.

海上警察 捍衛藍色國土

優異船舶設計　強化執勤能量

從海洋主權維護、保護漁民安全、海上交通救難，到海洋污染防制，海洋巡防總局的業務範圍，確實相當寬廣。良好的船舶裝備，是海洋執法的先決要件，多年來，船舶中心配合海洋巡防總局的實際業務需求，提供專業船舶設計與監造服務，逐步建置完整的編裝船隊，捍衛我國海上和平與安全。

海洋巡防總局副總局長王茂昇。

Mao-Shen Wang, the Deputy Director General of the Maritime Patrol Directorate General.

海洋巡防總局王茂昇副總局長，從保七時期服務至今已有 38 年之久，他表示，海上警察的最大特色，便是配有船舶裝備及人員專業駕駛能力；多年來，海洋巡防總局與船舶中心的合作關係，主要在於各式船舶的規劃、設計與監造。

王副總局長表示，隨著實務需求與時俱進，在船舶中心的協助規劃與專業知識提供之下，海洋巡防總局的裝備與人員完全脫胎換骨——過去同仁開 PVC 膠筏及 M4 港巡艇在內河巡航，現在已經進化到 3,000 噸級船艦，航程可達遠洋，甚至直升機也能夠直接於船上起降，裝備與能力皆不可同日而語。

先進裝備　護漁救難

海洋為兵家必爭之地，尤其南海在領海、鄰接區及經濟海域方面，容易與其他國家產生爭端，臺灣漁民能夠安心出海作業，往往有賴於海洋巡防總局的船艦保護。為了使海巡能量能夠有效與其他大國抗衡，船舶中心在設法克服技術層面的困難之餘，更要同時提高妥善率與活動力，以滿足海巡各種需求。例如在釣魚台對峙事件之後，船舶中心研發射程超過 120 公尺的強力水砲，有效嚇阻越界船舶，為漁民提供保護。

良好的船舶設計，也是海上搜救的重要利器，例如由船舶中心設計的「自動扶正搜救艇」（Rescue Boat, RB，俗稱不倒翁），能夠 360 度自動扶正，在海研五號救援事件中，即發揮極大功能。面臨強烈颱風及氣候、海象狀況相當惡劣的情況，亦仰賴船舶優良的性能與品質，才得以完成艱困的救援任務。

建置船隊　提升能量

海洋巡防總局目前執行中的長期計畫，是自民國 99 年（2010）至 108 年（2019）的「強化海巡編裝發展方案」，預定完成新建 3,000 噸級、2,000 噸級及 1,000 噸級巡防救難艦各數艘，同時汰建遠洋巡護船、巡防救難艇及延壽巡防艦，主要由船舶中心負責設計、監造，目前已陸續交船，未來可望有效強化我國海域執法實力，並且增強遠航巡護能量及遠距通訊能力。SOIC

在船舶中心的協助規劃與專業知識提供之下，海洋巡防總局的裝備與人員完全脫胎換骨。

The equipment and personnel of the Maritime Patrol Directorate General have been completely changed by means of the assistance planning and professional knowledge provided by the SOIC.

期勉語

多年來的密切配合，讓海洋巡防總局與船舶中心成為最好的合作夥伴，王副總局長期許船舶中心業務持續成長茁壯，為海洋巡防總局設計研發更高效能且經濟的優良船舶，打造雙贏局面，並肩為國家海域發展及海洋權益共同努力。

良好的船舶裝備，是海洋執法的先決要件，完整的編裝船隊能有效捍衛我國海上和平與安全。

Good ship equipment is the most important factor for law enforcement in the ocean; a fleet with perfect equipment can effectively defend the ocean peace and safety of our country.

The Ocean Police Protects the Blue National Land

From ocean sovereignty protection, protecting the safety of fishermen, ocean traffic rescue to ocean pollution prevention, the business range of the Maritime Patrol Directorate General is definitely "Wide". Good ship equipment is the first condition for ocean law enforcement; for these years, the SOIC has provided the professional ship design and shipbuilding monitoring services according to the actual business requirements of the Maritime Patrol Directorate General to gradually complete a fleet for protecting the peace and safety of our country.

Mao-Shen Wang, Deputy Director General of the Maritime Patrol Directorate General, indicated that the major features of the ocean police is their ship equipment and the professional driving ability. Over the past years, the cooperative relationship between the Maritime Patrol Directorate General and the Ship and Ocean Industries R&D Center (SOIC) has been based on the planning, design and shipbuilding monitoring of various ships.

As the actual requirements vary with time, the equipment and personnel of the Maritime Patrol Directorate General have been completely changed by means of the assistant planning and professional knowledge provided by the SOIC. In previous years, the staff drove the PVC plastic rafts and M4 harbor patrol boats to patrol inland rivers. Currently, these ships have been advanced to 3000- ton level ships and the distance run by these ships can reach far into the seas; further, helicopters can also take off or land on the ships; thus, the equipment and ability of these ship are completely different from those of the previous ones.

Advanced Equipment – Protect Fishery Resources and Rescue Victims

The ocean is of great military importance. In particular the South China Sea, as the South China Sea tends to bring about conflicts with other countries in territorial seas, adjacent zones and economic sea zones, the fishermen of Taiwan always need to be protected by the ships of the Maritime Patrol Directorate General to safely work in the sea zones. The SOIC has not only overcome the difficulties in the technical field, but also increased the availability and the activity of the ships. For example, after the conflict event at the Diaoyu Islands, the SOIC developed a powerful water cannon with more than 120m firing range, which can effectively deter the ships crossing the border in order to protect the fishermen.

The "Rescue Boat" (RB, also called "Tumbler") designed by the SOIC has the 360° automatic self-righting function; therefore, the performance and quality of the ship can finish difficult rescue tasks even if the sea conditions are extremely bad.

Establish Fleet – Increase Energy

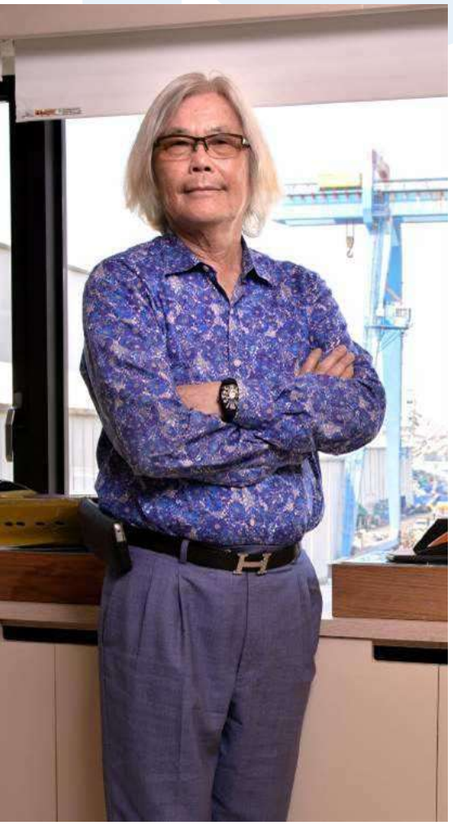
The long-term project currently executed by the Maritime Patrol Directorate General is the "Coast Guard Equipment Development Project" from 2010 to 2019. The project is anticipated to build several 3000-ton level, several 2000- ton level and several 1000-ton level coast patrol & rescue ships, and build the far-sea patrol boats and patrol rescue boats for replacing the old ones and extend the service life of the patrol ships, which are mainly designed and monitored by the SOIC.

Due to their close cooperation for many years, the Maritime Patrol Directorate General has become the best cooperation partner of the SOIC; Mr. Wang, Deputy Director General, hopes that the business of the SOIC can keep growing towards a more cooperative effort to better the sea field development and protect the ocean rights of our country.

開創未來
造船產業新時代

技術轉型　朝國艦國造邁進

臺灣的造船優勢，以遠洋漁業為例，冷凍、圍網、秋刀魚魚船在性能、省油性、捕獲率上傲視全球，讓日、韓等漁業強國不惜「捨近求遠」來臺灣造船。東南亞地區則因發展海洋巡防，也看上臺灣造船廠「物美價廉」的特色，競相下訂巡邏艦艇，實力可謂有目共睹。



造船公會理事長韓碧祥。

Bi-Xiang Han, the Board Director of the Taiwan Shipbuilding Industry Association.

連任 6 屆造船公會理事長的韓碧祥，其所職掌的中信造船走過 30 個年頭，造船版圖從漁船延伸至公務船、豪華遊艇、商船、交通船、研究船、巡防艦艇等專業特殊領域。環看臺灣現今的造船產業，韓碧祥細數臺灣的優勢，加拿大、西班牙、美國、北歐、日本、韓國、菲律賓等國家，都看上臺灣造船「價格實在、性能與品質先進」，競相慕名而來。

精進轉型　再造市場競爭力

仰賴船舶中心的輔導，韓碧祥自家的中信造船廠從 50 噸級的海巡署巡邏艇一路做到 3,000 噸級的巡防艦，過程中還取得船體振動、噪音控制的獨家優勢，間接促成韓碧祥在民國 92 年（2003）接下世界頂尖遊艇訂單的機緣。

許多造船公會業者和中信一樣，在船舶中心的協助下，成功轉型成為優質的船舶製造業者。有一家原本擅長玻璃纖維船體製造的造船廠，在船舶中心的輔導轉型後強化「輕量」的特色，目前專門承接國外客輪、快速艇的業務，甚至擁有自行研發的能力；也有造船廠透過船舶中心的輔導成功轉型，從漁船專家搖身一變成為海軍艦艇的製造商。

專業整合　少量多樣成競爭優勢

往來世界各地，韓碧祥看見各國對造船業發展的野心。韓國業者在政府補助扶持之下，推動大型商船、油輪的自動化量產；中國政府則在漁船造船、用油上傾力補貼至少 6 成。相較於臺灣「少量多樣」的造船模式，反而發展出「客製化」的競爭優勢。

有鑑於臺灣擁有多項與船舶有關的研發技術，「國艦國造」便是造船業引頸期盼的新舞台。船舶中心自民國 96 年（2007）起，輔導領域從大型商船轉向軍用及特殊船舶。造船公會於民國 105 年（2016）9 月 14 日到 17 日在高雄舉辦首屆「臺灣國際海事船舶展暨國防工業展」，史無前例地整合國防、船舶機械、海洋工程、通信航儀、綠色能源等先進產業，期盼帶動「團體戰」的概念，重整臺灣的產業鏈，也替造船業的轉型尋求新世代發揮的可能性。SOIC

中信造船版圖從漁船延伸至公務船、豪華遊艇、商船、交通船、研究船、巡防艦艇等專業特殊領域。

The shipbuilding business of the Jong Shyn Shipbuilding Co., Ltd extends from fishing boats to official ships, luxurious pleasure boats, commercial boats, traffic boats, research boats, patrol vessels and other professional special-purpose fields.

造船公會中的許多業者和中信一樣，在船舶中心的協助下，成功轉型成為優質的船舶製造業者。

Many companies in Taiwan Shipbuilding Industry Association, just like Jong Shyn, are assisted by SOIC to be successfully transferred into excellent shipbuilding companies.

期勉語

除了在研發與設計上，船舶中心在媒合、仲介、溝通協調的角色上更顯重要。未來因應軍艦、特殊船型等需求，建議船舶中心整合相關產業資源，協助業者強化優勢或轉型，朝市場區隔的方向經營。

Create a New Age for the Shipbuilding Industry

The Jong Shyn Shipbuilding Co., Ltd directed by Bi-Xiang Han, the board director of the Taiwan Shipbuilding Industry Association for 6 consecutive sessions, has existed for more than 30 years. Its shipbuilding business extends from fishing boats to official ships, luxury pleasure boats, commercial boats, traffic boats, research boats, patrol vessels and other professional special-purpose fields. The shipbuilding ability of Taiwan has been recognized by the world, including Canada, Spain, the USA, northern Europe, Japan, Korea and Philippines, etc., settling on Taiwan's shipbuilding's advantage "Fair price – Advanced performance and quality."

Taiwan has a number of shipbuilding advantages. Take the distant fisheries as an example, refrigerated carriers, seine-net fishing boats and pacific saury/sleeve fish boats are the best in the world in performance, oil saving and capture rate. Thus, Japan, Korea, and other developed fishing countries rather "go the long way" to reach Taiwan for shipbuilding. Regarding the South East Asia Region, they also settle on the advantage "Fair price – High quality" of Taiwan's shipbuilding companies and order patrol vessels one by one because they are currently developing their own marine patrols.

Try Hard for Transformation – Create Market Competitiveness Again

From 2007, the assistance range of the SOIC has been transferred from large commercial boats to military and special-purpose boats. With the assistance provided by SOIC, the Jong Shyn Shipbuilding Co., Ltd directed by Bi-Xiang Han, the SOIC could implement the shipbuilding from a 50-ton level patrol vessel for the Coast Guard Administration to a 3000- ton level frigate. During the process, the company also obtained the advantage of unique technologies, including ship body vibration control and noise control, which indirectly provided the chance for Bi-Xiang Han to obtain the orders for world-class pleasure boats in 2003.

Many companies in the Taiwan Shipbuilding Industry Association, just like Jong Shyn, are assisted by SOIC to be successfully transformed into excellent shipbuilding companies. In the beginning, the Lung Teh Shipbuilding Co., Ltd was involved in manufacturing glass fiber ship bodies. After the transformation assisted by the SOIC, they focused on the "light weight" feature; currently, they are focused on the shipbuilding business of foreign passenger steamers and racing boats. Moreover, they also have their own R&D ability.

Professional Integration – Shipbuilding Mode of Small-volume & Large-variety

Taiwan's shipbuilding mode of small-volume & large-variety has developed the "Customized" competitive advantage.

Taiwan has various ship R&D technologies; therefore, the "Navy Vessel Built Domestically" is the new stage that the shipbuilding industry looks forward to.

In addition to R&D and design, the more important aspect is that the SOIC plays an important role in matching, brokering, communications and negotiations. In the future, in response to the demands for military vessels or special-purpose boats, it is suggested that the SOIC should integrate the relevant industrial resources to help the shipbuilding companies to enhance their advantages or conduct the transformation in order to highlight their market segmentation.

品質保證 臺灣遊艇立足世界

工藝與技術融合　打造頂級遊艇

每艘頂級遊艇背後蘊藏著深不可測的智慧，無論是造船技術還是設計構想，兩者缺一不可。在南海遊艇與船舶中心的合作模式中，我們看見民間企業與專業單位共同締造的能量，更看見臺灣遊艇之競爭力昂首國際。

南海遊艇董事長陳朝南。

Chao-Nan Chen, the Chairperson of Bluewater Yacht Builders Ltd.

「每次出國，我只要從碼頭遠處看遊艇的外觀，就知道這艘是來自臺灣，精緻工藝就是最好的 Logo。」南海遊艇董事長陳朝南認為臺灣遊艇師傅手藝高超、做事認真，如果沒有他們的努力，絕對不可能造出品質傲視全球的高級遊艇。

多方合作　才能打造完美遊艇

一路走來，臺灣遊艇業經歷數次轉型，憑著優異品質與務實價格，讓臺灣遊艇在競爭激烈的市場中站穩腳步，特別是客製化遊艇，MIT 就是國際富豪認同的金字招牌。除了頂級工藝，先進的思維更是推動頂級遊艇的重要燃料，因為造船不只需要技術與經驗，更需研發單位的設計支援，這正是船舶中心無可替代的價值。

以南海遊艇打造的 42 呎綠能遊艇（uGreen 42 HYBRID）為例，這艘精品遊艇的基本設計、結構設計分析、管路、電機設計工程由船舶中心負責，再加上南海遊艇長達 40 年的純熟工藝，曾獲優良設計獎（GOOD DESIGN AWARD）2013、2014 最佳遊艇獎、經濟部工業局金點設計獎等 3 大指標性大獎，深受好評。

展望未來　我們賣的不只是遊艇

陳朝南說：「在臺灣造船界，船舶中心是非常重要的幕後推手。臺灣造船業者沒有專業研發人力，幸好有船舶中心一起打拚，為我們提供充分的技術後盾。」

展望未來，陳朝南認為臺灣遊艇界需要的不只是技術，還有整合性規劃，尤其是剛起步建置的「遊艇碼頭」。陳朝南借鏡歐美先進國家，遊艇碼頭的功能不只是停放遊艇，更需要在周邊加入俱樂部、飯店……等，打造出一套完整的遊艇休閒系統，才能有效吸引金字塔頂端消費者的青睞，提供臺灣優質、健康的觀光產業體質。陳朝南認為：「如何完整規劃？做好環保？應借重先進國家成功案例，妥善規劃及設計，無論是政策法令還是民間觀念都需要轉變，這是船舶中心未來值得思考的方向。」SOIC

臺灣遊艇業經歷數次轉型，MIT 就是國際富豪認同的金字招牌。

The yachts industry in Taiwan has undergone numerous industrial restructuring. MIT is a brand name recognized by business tycoons around the world.

期勉語

陳朝南相信「事在人為」，更清楚未來「臺灣賣的不只是遊艇」。期許臺灣遊艇產業在船舶中心帶領之下，共同努力產業升級，讓全世界看見臺灣的特色 。

南海遊艇打造的 42 呎綠能遊艇曾獲優良設計獎 2013、2014 最佳遊艇獎、經濟部工業局金點設計獎等 3 大指標性大獎，深受好評。

Built by Bluewater Yacht Builders Ltd., the uGreen 42 HYBRID has received the Good Design Award in 2013, the Asia Boating Awards in 2014, and 3 awards categories from the Golden Pin Design Award run by the Industrial Development Bureau, Ministry of Economic Affairs.

Taiwan Yachts Industry Gains Global Appraisal

Behind each luxurious yacht lies a profound wisdom, be it a shipbuilding technique or a ship design concept. Under the collaborative mode between the "Bluewater Yacht Builders Ltd." and the "Ship and Ocean Industries R&D Center," we can see how private business and professional institutes work together to generate greater power, and how yachts in Taiwan have gradually gained global recognition and appraisal from global communities around the world.

"Each time when I am aboard and see a yacht from a faraway distance on the dock. I know immediately that the yacht is made in Taiwan. The exquisite craftsmanship is the best advertisement for yachts from Taiwan," said Bluewater Yacht Builders Ltd. Chairperson, Chao-Nan Chen. He believes that the superb handicraft and hard efforts of the yacht masters in Taiwan have greatly contributed to the world-class yachts.

Perfect Yachts Built under Transdisciplinary Collaboration

A customized yacht is a brand name recognized by business tycoons around the world. Aside from superb handcrafting, advanced ideas are what push the luxurious yachts to the limit. This is because shipbuilding requires not only technique and experiences, but also design and support from R&D institutions. All these contributing factors have made the SOIC even more indispensable.

Take the uGreen 42 HYBRID built by Bluewater Yacht Builders Ltd. for example, the SOIC is responsible for the basic design, structural analysis, pipeline arrangements and electromechanical engineering of the exquisite yacht, while the Bluewater Yacht Builder Ltd. is responsible for practical shipbuilding with mature handcrafting that has been cultivated for more than 40 years. The uGreen 42 HYBRID has received numerous awards, including the Good Design Award in 2013, Asia Boating Awards in 2014, and 3 awards categories from the Golden Pin Design Award run by Industrial Development Bureau, Ministry of Economic Affairs.

Future Prospects: We Sell Not Only Yachts

Bluewater Yacht Builders Ltd. Chairperson Chao-Nan Chen credited the successful yacht design to SOIC, "For shipbuilding industry in Taiwan, the SOIC is an extremely important technical supporter standing at the backstage. Since the shipbuilding industry in Taiwan lacks a professional R&D group, we are lucky to have the SOIC working with us. The SOIC really provides us with sufficient technical support all the time."

Since the yacht industry in Taiwan requires not only techniques but also integration, especially for the developing marina, which is still at its infancy stage. A marina not only serves the function of yacht docking, peripheral establishments such as club, hotel...etc. must also be incorporated to create a complete yacht recreational system that attracts customers at the top of the pyramid.

Bluewater Yacht Builders Ltd. Chairperson Chao-Nan Chen believes that "where there is a will there is a way" and is fully aware that "Taiwan sells not only yachts." Under the guidance of the SOIC, we hope to see industrial upgrading in the future.

專注完美 世界最好的螺槳

端板螺槳　提升行船精緻度

船艦要航行得快又穩，關鍵在於船身與螺旋槳的搭配，就像田徑選手與一雙好鞋之間的完美搭配。宏昇的端板螺旋槳能夠讓船隻展現省油、輕快、安靜的航行特色，把造船工藝水準推向新的顛峰。

宏昇螺旋槳股份有限公司董事長鄭正義。

Zheng-Yi Zheng, the Director of the Board of HUNG SHEN PROPELLER Co., Ltd.

來自澎湖七美，對大海有著濃厚情感的董事長鄭正義，民國 64 年（1975）創立「宏昇螺旋槳股份有限公司」，生產高精密度的軸系、螺旋槳等船舶關鍵零組件。軍艦、海巡艦艇、油輪、快艇，甚至是交通船澎湖「南海之星」、各處離島交通船、國外中小型船舶，幾乎都看得到宏昇螺旋槳的蹤跡。

民國 85 年（1996），因應政府推動「國艦國造與產業升級」政策，宏昇在經濟部技術處及工業局的輔導下，與船舶中心、國立臺灣海洋大學三方合作，針對船艏船艉側推器、螺旋槳理論設計法建立、新系列螺槳應用、彎殿緣螺槳開發、水上休閒載具、電力推進系統、新型端板螺旋槳等技術，進行長達 15 年的研發。

品質優異　擊敗國際知名大廠

與船舶中心合作的過程中，宏昇展現出「量身打造」的客製實力。鄭正義回顧 2 次印象深刻的合作經驗，一次是慶富造船廠承包 4 艘 600 噸級海巡署巡邏艦的建造計畫，當時共有荷蘭、日本、臺灣等 4 間國際知名船舶零件廠商競標，鄭正義為此還投入數百萬元研發經費。

負責船體設計的德國廠商 Lürssen（該公司專門設計軍艦）看過設計圖之後，指明就要宏昇的螺旋槳。驗收時，第一艘船便輕鬆跑出 30 節的標準速度，讓 Lürssen 監造人員當場比出大拇指稱讚。

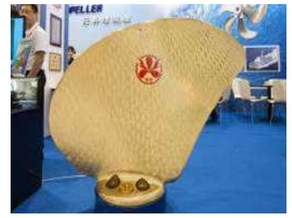
另一次為中信造船廠 500 噸級海巡署巡邏艦的建造計畫，當時造船廠採用荷蘭知名大廠提供的螺旋槳，安裝後發現無法達到轉速、節速的要求，恐怕面臨一日 50 萬元的罰款。沒想到，緊急換上宏昇提供的備品後，就順利達到交船標準，而這次漂亮的上場救援，也讓宏昇賺足了面子，在國際船舶市場上傳為佳話。

靜快穩　端板螺旋槳技術揚名國際

宏昇與船舶中心合作時間最長、最具成效的是「高性能端板螺槳技術」的研發。該技術特色為透過螺旋槳葉面尾端的反折設計，降低渦漩與氣泡的產生，達到「減噪 60%、提升推進效率 5%」的效果，目前已能應用在斜軸、高速的船型上，達到 38 節的船速。

宏昇螺旋槳股份有限公司全體同仁致力造船工藝水準推向新的顛峰。

All personnel do their best to promote the shipbuilding craft.



宏昇生產各種高精密度的軸系、螺旋槳等船舶關鍵零組件，擁有量身打造的高水準實力。

HUNG SHEN manufactures various high-precision shaft series, propellers and other key ship components.

民國 103 年（2014）取得專利後，陸續應用在豪華遊艇、高速旅客船上。在特殊專業領域，如國內海軍光三巡防艦、光六飛彈快艇、海巡署艦艇、國科會海研五號研究船、國外海軍登陸艦等也被廣泛採用。其中，海研五號螺旋槳的靜音等級，通過美國 NCE 專業噪音量測公司驗證，已達到潛艦級的規範要求。

宏昇成為頂尖的螺旋槳製造商，船舶中心及臺灣海洋大學功不可沒。從研發、設計、製造，到行銷通路均全力促成，就連成果專利也都無私轉讓。而自漁船製造起家的鄭正義，揚名國際時也不忘回饋，端板螺旋槳技術已廣泛應用在國內漁船的製造上，未來甚至有機會被臺灣的國防產業採用。鄭正義認為，讓優質的技術造福國內市場，才能彰顯業者精進的價值。SOIC

期勉語

過去臺灣以電子業為傲，如今，造船業才是真正傲視全球的實力。在全球化、工業 4.0 的挑戰之下，國內造船產業雖有亮眼成績，但也正面臨人才斷層的危機。除了輔導產業升級之外，希望船舶中心能協助業界培育更多年輕後進，吸引更多優質造船相關人才投入，維持產業競爭力

合作紀事

- 民國 85 年：「高速艇用螺槳新系列之設計與製造技術發展五年計畫」
- 民國 90 年：1.「船舶技術發展第二期四年計畫」—— 四葉面積比 0.75 之高速快艇螺槳效率與性能應用技術
  2.「船舶產業電子化研發中心與高性能組件開發計畫」—— 側向推進器開發技術
- 民國 92 年：「船舶技術發展第二期四年計畫」——高速艇螺槳准理論設計法建立
- 民國 93 年：「船舶技術發展第二期四年計畫」——五葉新系列螺槳效率與性能應用技術
- 民國 94 年：「高性能船舶技術發展三年計畫」——四葉殿緣高弦拱螺槳設計分析
- 民國 95 年：「高性能船舶技術發展三年計畫」——四葉低面積比殿緣高弦拱螺槳設計分析
- 民國 103 年：高速船用端板螺槳產品開發
- 民國 104 年：「協助傳統產業技術開發計畫」——四葉中速船用端板螺槳產品開發

The Best Propeller in the World

Zheng-Yi Zheng founded the “HUNG SHEN PROPELLER CO., LTD” in 1975 to manufacture high-precision shaft series, propellers and other key ship components. All of the war ships, cruisers of the Coast Guard Administration, mail liners, speed boats or Penghu’s traffic boat “South Sea Star ”, traffic boats of various islands and domestic/foreign small-medium boats use HUNG SHEN propellers.

In 1996, the government promoted the “Taiwan Domestic Shipbuilding industries and Industry updating” policy. HUNG SHEN assisted by the Department of Industrial Technology (DoIT) and Industrial Development Bureau (IDB) of the Ministry of Economic Affairs had cooperated with the SOIC and the National Taiwan Ocean University (NTOU) to conduct the R&D for 15 years about stern thrusters, bow thrusters, propeller theory design method establishment, new series propeller applications, propeller with cup, water leisure carriers, electrical power propulsion systems, novel end=plate propellers and the like.

High Quality Beats Internationally Famous Manufacturers

Zheng-Yi Zheng reviewed two impressive cooperation experiences; one is the shipbuilding plan of four 600-ton level cruisers of the Coast Guard Administration contracted by Ching Fu Shipbuilding.

After the German manufacturer “Lurssen” (the company is versed at designing war ships) saw the design diagram, the company designated the use of the HUNG SHEN propeller .

The other one is 500-ton patrol vessel of the Jong Shyn Shipbuilding. During that time, the Jong Shyn Shipbuilding adopted the propeller of the famous manufacturer from Holland. However, after the propeller was installed on the ship, the ship failed to achieve the requirements of the rotation speed and knot speed. Fortunately, after the propeller was replaced by the HUNG SHEN propeller, the ship was able to satisfy the acceptance standards.

Quite, Swift, Stable – Plate Propeller Technology Becomes World-Famous

The development product that HUNGSHEN and the SOIC cooperated on for the longest amount of time was on the R&D for a “high-performance endplate propeller technology.” The primary feature of the technology was to reduce the generation of swirls and bubbles via the reverse-folded design at the end of each blade of the propeller in order to “reduce noise by 60% and increase propulsion efficiency by 5%.” Currently, the technology can be applied to the ship models with oblique shafts or high-speed ship models to achieve 38-kt ship speed.

The technology has been applied to various Gung-3 frigates of the Taiwan Navy, Gung-6 fast missile craft, the patrol vessels of the Coast Guard Administration, RV-OR5 research boats of the National Science Council and the navy landing ships of various foreign countries one after another, which has reached the requirements of submarine-level regulations.

The SOIC and NTOU have made a great contribution towards HUNG SHEN becoming a leading propeller manufacturer. These institutions provided their assistance from design, manufacturing to marketing channels. Moreover, these institutions also transferred the result patents to HUNG SHEN without any conditions. After HUNG SHEN became a leading manufacturer in the world, Zheng-Yi Zheng, beginning from its manufacturing fishing boats, never forgot to return these favors. The endplate propeller technology has been comprehensively applied to the manufacture of fishing boats of Taiwan. In the future, the technology may be further applied to the national defense industry of Taiwan.

國際認證
打造永續經營航道

船舶建造最可靠的把關者

一艘適航船舶的誕生，從內而外涉及多元層面，須有專業機關協助查驗。中國驗船中心（Classification Society，簡稱 CR）為我國政府唯一認可的驗船機構，自民國 40 年成立以來堅守職責，對國內航運業貢獻卓著。

財團法人中國驗船中心董事長趙國樑。

Guo-liang Chao, the Chairman Board of Director of Classification Society.

CR董事長趙國樑在散裝船運市場擁有近 40 年資歷，早年在香港從事船務工作，曾任中國航運副總經理、香港首長運輸總經理，民國 85 年（1996）返台籌設中鋼運通，在其領軍的 18 年期間，寫下年年獲利、EPS 最高達 23.2 元的輝煌紀錄，成為中鋼的小金雞母。

良性合作　追求國輪品質最佳化

趙國樑回憶在中運時期，就與船舶中心有密切合作，新船設計規範之擬定與監工皆委託船舶中心，且因中鋼運通未設有研發組織，相關工作也長期委請船舶中心執行，包括對其優化船舶動力的節能裝置 PBCF，可節省 3%至 5%的能源，留下深刻印象，後來幾乎所有中運船隻都予以裝設，堪稱是最支持船舶中心的盟友之一。

過去 60 年來，CR 不畏險峻的國際情勢，從各種管道，設法迅速取得國際最新規定，進一步提出因應措施，並邀請國際海事組織（IMO）人員到國內認證目標型船舶建造標準（GBS），確保國輪能符合國際公約要求，通過港口國管制（PSC）查驗，在世界各地暢行無阻。在 CR 長久努力下，各國均已承認 CR 簽發證書的效力。趙國樑特別提到，CR 的表現度評比，與主要的外國驗船機構並駕齊驅，使得多年來國輪在 PSC 檢查紀錄中，維持在白名單上最佳成績，實屬不易。

目前 CR 有 50 餘位專業驗船師，除了臺灣授權認證之外，尚有巴拿馬、貝里斯、吐瓦魯、吉里巴斯、蒙古、柬埔寨、多米尼克等國授權。截至民國 105 年（2016）初，入級 CR 的營運中船舶共有 415 艘，合計總噸位約 543.6 萬噸，平均船齡 12.3 年。多年來，兩機構發展出絕佳默契，船舶中心為國內多家航運公司及政府機關規劃設計各種船型，CR 再執行審核驗證，彼此是良性的合作夥伴關係，以求船舶品質最佳化。

離岸風電　創新營運模式

面對國際金融風暴後危機時代，全球航運陷入低迷，民國 104 年（2015）後鮮少有新船建造計畫。趙國樑自 101 年（2012）接下 CR 董事長以來，力圖發展新業務，以突破營運困境。適逢臺灣開始發展離岸風力發電，船舶中心看好未來再生能源的熱點項目，力邀 CR 加入研發行列。

目前CR有50餘位專業驗船師，除了臺灣授權認證之外，尚有巴拿馬、貝里斯、吐瓦魯、吉里巴斯、蒙古、柬埔寨、多米尼克等國授權。

Currently, CR has employed more than 50 surveyors. Aside from domestic authorization and authentication, countries such as Panama, Belize, Tuvalu, Kiribati, Mongolia, Cambodia, and Dominica are also included.

為此，CR 於 102 年（2013）即成立 5 人風能組，投注 1,500 萬元訓練費用，派員至國外學習離岸風電認證技術，並接續成立技術處、研究團隊，分別專責研發風力機與專用工程船結構，以及研究颱風與地震對測風塔及海底基座的影響。在經濟部 103 年（2014）ICP 工業合作計畫中，CR 和船舶中心已共同申請，與美國驗船協會（ABS）合作建置風電安裝船的認證方式。

潛艦國造　注入本土研發能量

除了發展離岸風電，CR 也與船舶中心一同關注「潛艦國造計畫」，考量臺灣海域環境，美國方面建議我國以 200 噸的小潛艦為主。趙國樑讚許船舶中心擁有豐沛設計能量，國內無人能出其右，以其多年的船舶核心研發技術，應可達成國艦國造的重要使命。

SOIC

期勉語

「我希望船舶中心未來能更好。」趙國樑以一句簡潔有力的話，道盡對船舶中心的無限祝福。他期望船舶中心能與 CR、台船三方通力合作，在設計、認證、製造層面上互補，多加宣傳臺灣已達國際水準的造船實力，進而帶動我國航運業向上提升；同時將此模式擴展到離岸風電與國艦國造，為臺灣造船及海洋產業打開一條永續經營的航道。

多年來，兩機構發展出絕佳默契，船舶中心為國內多家航運公司及政府機關規劃設計各種船型，CR 再執行審核驗證。

Under a long-term cooperation, the two institutions have developed a great partnership. After the SOIC plans and designs various types of vessels for domestic shipping companies and government agencies, CR sets out to perform review and classification on these vessels.

International Certification Creates Sustainable Channel

CR Classification Society is the only classification society authorized by the domestic government.

CR Chairman Guo-liang, Zhao has once engaged in shipping industry in Hong Kong during his early years. After holding the posts of Vice President of the "Chinese Maritime Transportation Limited" and Transportation General Manager under the "Chief Executive of Hong Kong," he returned to Taiwan in 1996 to establish the "China Steel Express."

Great Partnership for Optimizing Domestic Vessel Quality

Chairman Guo-liang, Zhao revealed that back at the time when he was working at the "Chinese Maritime Transportation Limited," he maintained close cooperation with the SOIC. Back then, the SOIC was entrusted with a task of drafting and supervising regulations on new ship designs for the "Chinese Maritime Transportation." In addition, since the "Chinese Maritime Transportation Limited" has not yet established any R&D organizations, the SOIC was also entrusted with relevant tasks under a long term contract, including designing Propeller Boss Cap Fins (PBCF), which optimize ship propulsion while saving up to 3-5% of the total energy. As Chairman Zhao recalled, almost all ships of the "Chinese Maritime Transportation Limited" were installed with PBCF back then.

Under a long-term cooperation, the two institutions have developed a great partnership. After the SOIC plans and designs various types of vessels for domestic shipping companies and government agencies, CR sets out to perform review and classification on these vessels. With this great partnership, the two institutions worked together to optimize overall ship quality.

Developing New Businesses-Offshore Wind Energy Technologies.

Since Guo-liang, Zhao held the post of CR President, he has been committed to developing new businesses to break through current operational dilemma. During his term of office, a national wind energy policy is formally enacted. Since renewable energy is a technology full of future prospects, the SOIC enthusiastically invited CR to engage in its research and development.

For this, CR established the Wind Energy Sector with a total of 5 members in 2013. A total of NT$ 1.5 million was invested in member training, delegates were dispatched to foreign countries to learn offshore wind energy certification technologies and a technical sector and research group were established to develop wind turbines and dedicated engineering ship structures as well as study how typhoon and earthquake affect anemometer towers and undersea support structures, respectively.

The CR and the SOIC also focused on an "Indigenous Defense Submarine (IDS)" project together. Considering ocean ecology in Taiwan, the U.S. recommended that a small submarine with 200 metric tons would work best for Taiwan. Chairman Guo-liang, Zhao praised the SOIC's experienced design capacity and expected the SOIC to fulfill the important mission of "Indigenous Defense Submarine (IDS)."

"We hope the SOIC a bright future," with a simple but powerful statement, President Guo-liang, Zhao expressed his boundless blessings for the SOIC. He hopes that the SOIC, CR and CSBC would work together to complement each other in terms of design, certification and shipbuilding aspects. By doing so, the global community would learn that the domestic shipbuilding capability has already achieved the global level, which will in turn raise the overall level of the domestic shipping industry. At the same time, the same model will be applied to offshore wind energy and indigenous defense submarine projects, facilitating sustainable operations in the domestic shipbuilding and maritime industry.

薪火傳承
開拓未來先機

扮演船舶產業領航舵手

在國內船舶結構教學領域赫赫有名的王偉輝教授，當年就讀臺大造船研究所時的指導老師之一即為張達禮教授，在海洋大學教書後又多次與船舶中心有計畫往來，兩者淵源深厚，而雙方在專業技術上的攜手合作，更為臺灣造船結構設計奠定扎實基礎。

海洋大學王偉輝教授。

National Taiwan Ocean University
Professor Wei-Hui Wang.

王偉輝教授從民國 64 年（1975）起即在海洋大學系統工程暨造船學系任教船舶結構設計，他回憶，早期外界常誤解造船業如同拼裝產業，事實上造船是極複雜的系統工程，一艘船 90% 以上的設計製造均牽涉到結構，其零組件數量比建構汽車與飛機還更複雜。

尤其二次大戰後，船舶朝高速化、大型化與節能化發展，結構設計更形重要，而且深深影響著航行安全，每一艘船舶設計監造完成後，需合乎國際標準才能取得船舶安全證書，大學的船舶結構教學內容必須完全跟著國際造船法規之要求與時俱進。若說造船產業是臺灣最早國際化的產業，實在不為過。

發展自有技術　獲國際好評

「在我 40 年的學術生涯中，幾乎每年都跟船舶中心合作，進行專題研究、推薦學生實習或船型結構設計等各種計畫。」王偉輝教授說，自己的教學生涯前後可分為船舶結構分析設計、船舶船型系統與振動噪音研究 3 個階段，每個階段與船舶中心均有密切合作關係。

民國 72 年（1983），海巡署計畫建造一批巡邏快艇，由當時擔任海巡署造船顧問召集人的他制定規格，船舶中心負責設計，因品質良好，海巡署日後凡公務船皆委託船舶中心設計，由國內造船廠負責建造，對素來向國外採購海巡船舶此一舉措而言，是一大突破。

令王教授津津樂道的還有船舶中心獲得國際船舶界設計案的往事，他記得在民國 67 年（1978）左右，成立不到 5 年的船舶中心配合台船透過國際競標，成功取得美國最大石油公司 Exxon 的油輪設計案，「以往都是美國協助臺灣設計船舶，如今反過來臺灣有能力幫美國設計了！」耀眼成績讓全體造船業備受鼓舞 。後來，丹麥知名貨櫃運輸集團 Maersk 公司也找上門來，委託為其設計貨櫃船，顯見船舶中心設計功力已普遍受國際船舶界肯定。

建構知識平台　作育人才

王教授認為，船舶中心除了自身表現傑出，對於促進臺灣整體造船業技術更是不遺餘力，多年來偕同產學界參與國際船舶結構會議，此項會議由全球一流船舶專家與權威參加，將世界尖端造船技術引進臺灣，讓國內產、官、學、研等人士共同學習與成長。他自己從民國 74 年（1985）到 95 年（2006）出席該會，得以與各國造船界菁英深層交流，21 年沒有間斷過，王教授認為，這絕對是臺灣重要的造船技術與知識平台，對國內造船界影響深遠。

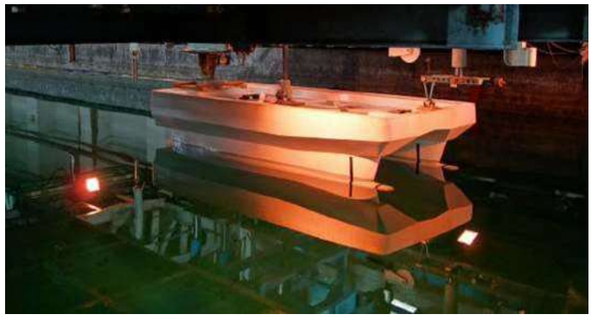
船舶朝高速化、大型化與節能化發展，結構設計更形重要，而且深深影響著航行安全。

As the development of ships is moving towards high-speed, scaled-up and energy-saving perspectives, structural design has become even more important as it would deeply affect navigational safety.

SOIC

期勉語

今年適逢船舶中心成立 40 週年，王教授由衷期勉：「未來造船產業特別需要良好的整合能力，希望船舶中心有計畫性地培育人才，並持續建構造船知識與技術的平台，為有潛力的年輕一輩培養寬廣視野。」踏入 40 不惑階段的船舶中心，肩負承先啟後、繼往開來的培育角色，稱職扮演船舶產業舵手的角色，是全體造船業界之福。



造船是極精密的系統工程，一艘船有 90% 設計製造均牽涉到結構，其零件組成比建汽車與飛機還更複雜。

Shipbuilding is regarded as a very sophisticated systems engineering. 90% of the design and manufacturing of a ship are involved with structure and its parts and component are even more complicated than an automobile and aircraft.

Pioneer and Forge Ahead into the Future

Since 1975, Professor Wei-Hui, Wang has been teaching Ship Structural Design at the National Taiwan Ocean University Systems Engineering & Naval Architecture. Shipbuilding is regarded as a very sophisticated systems engineering as 90% of the design and manufacturing of a ship are involved with structure and its parts and component are even more complicated than building a automobile and aircraft.

As the development of ships is moving towards high-speed, scaled-up, and energy-saving perspectives, structural design has become even more important as it would deeply affect navigational safety. After completing the design and production, each ship must comply with international standards before it can be granted with a ship safety certificate. Hence, the teaching of Ship Structural Design in universities must closely keep pace with international trends and time.

Self-developed Technology Has Won International Acclaim

Professor Wei-Hui, Wang remarked that his own teaching career can be divided into three stages, namely Ship Structural Analysis & Design, Ship Design Systems and Research in Vibration & Acoustics. He has been keeping in close contact with the SOIC on each of the aforesaid stages.

In 1983, the Coast Guard Administration (CGA) planned to build a fleet of patrol cutters. Then, acting as the Shipbuilding General Counsel, Professor Wang was assigned to establish the standards and the SOIC was responsible for the design. Due to its excellent quality, CGA has been entrusting the SOIC to design all official vessels and the domestic shipbuilders responsible for building them in the future. Since then, the country no longer had to buy design drawings from abroad. It is indeed a major breakthrough.

In 1978, the SOIC succeeded in securing a ship design project from the largest US tanker company Exxon through international bidding. “Formally, Taiwan had to seek help from the United States in ship designs, but now, we have turned around to help the United States in design instead!” Later on, the famous Danish container transport group Maersk had also requested Taiwan to design container ships. This has clearly shown that the design abilities of the SOIC have been widely affirmed by the international shipping community.

Construct a Knowledge Platform to Nurture Talents

The SOIC has spared no effort in promoting Taiwan’s overall shipbuilding technology by acting as an organizer to host the International Ship Structure Congress (ISSC) over the years. It is absolutely an important shipbuilding technology and knowledge platform in Taiwan.

Professor Wang sincerely believes that: “A sound integration ability is especially needed in the future shipbuilding industry. I hope that the SOIC has a long-term plan to nurture talents and will continue to maintain the shipbuilding knowledge and technology platform for the promising young generations to develop a broad vision.”

創新 Innovation

扎實的基本功、對新領域的企圖心，是船舶中心奠定優異實力的成因。

瞄準未來的再生能源新趨勢，船舶中心透過各式科技專案計畫，積極地替臺灣造船產業尋求轉型、進化的可能方向。離岸風電船機、海事工程船、研究船的開發，都是船舶中心積極布局、搶占先機的新領域。

從研發、培育人才、到輔導產業轉型，船舶中心肩負眾多使命，致力提升臺灣在世界船舶及海洋產業的優勢與競爭力。

Having a stable foundation and an ambition for expanding into new domains are the major factors behind the SOIC's successful business performance.

Aiming for a future with renewable energy, the SOIC has actively launched different science and technology development plans to facilitate the transformation of the shipbuilding industry in Taiwan. For example, offshore wind power, marine engineering ships and research vessels are some new domains where the SOIC has been actively engaged and for which the Center has energetically striven.

From R&D and talent cultivation to initiating industrial transformations, the SOIC has undertaken several missions and is dedicated to raising domestic advantages and competitiveness in global shipping and marine industries.

定錨海洋
深耕研發實力

穩定內需　致力創新　邁向國際

從組裝代工、設計，到自主研發，臺灣船舶產業扎根的每一個過程都有船舶中心努力的身影；在國家政策目標引導下，船舶中心更透過不斷積澱而日益深厚的「研發」實力，為船舶及海洋產業挹注必備的能量，這是臺灣作為海洋國家的生存之道，也是船舶中心的不懈使命。

船舶中心的使命在於協助臺灣船舶及海洋產業的發展，透過技術面的協助與輔導，提升產業國際競爭力，進而維持臺灣作為海洋國家所需的穩定成長的力量。也因為如此，船舶中心以不斷精進的技術與業界共存共榮，對於各個面向的需求有相當深刻的了解，帶領臺灣海洋產業與國際趨勢齊頭並進。

船舶中心協助船舶產業轉型、升級，對內可穩定海洋產業內需、亦可對外爭取訂單。

By assisting with transition and upgrades in the shipbuilding industries, the internal demand for marine industries can be stabilized while external orders can be secured.

為海洋產業找利基

40 年來，船舶中心聚焦於船舶的規劃與設計，從商船、公務船、遊艇到軍艦，已交出可觀的成績，提高了臺灣在國際舞台的能見度。隨著民國 100 年（2011）經濟部要求船舶中心擴大業務範圍，「聯合船舶設計發展中心」順勢更名為「船舶暨海洋產業研發中心」，除船舶產業之外，正式跨足海洋產業的研究發展。

海洋資源豐富，國外已積極從事海洋資源的探勘與研究，不只私人企業躍躍欲試，若干國家更透過政策立法來支持海洋事業的發展。為使臺灣在這波產業競爭中不落人後，船舶中心已投入資源，以海事工程船的研究與設計作為進軍海洋產業首部曲。此舉可協助船舶產業轉型、升級，對內可穩定海洋產業內需、亦可對外爭取訂單，拓展新的商機。

放眼新領域、新技術

有鑒於環保已成為普世價值，綠色能源／乾淨能源是各國競相發展的新興產業，也是臺灣力求經濟起飛所必須發展的方向之一。陪同臺灣海洋產業走過各個成長階段的過程中，船舶中心看見在現階段國內投入離岸風電的趨勢下，海事工程船將是下一個重要的挑戰——矗立海上的風機，從先期探勘、施工到運轉後的各種保養維修工程等，都有賴各式海事工程船隻才得以進行。在地球永續的前提下，再生能源的開發沒有回頭路，船舶中心將投入各式海事工程船的研發，為世世代代所需要的海上再生能源開發技術扎根！

此外，臺灣的遊艇產業雖然蜚聲國際，但一向仰賴老師傅的客製化精巧工藝，因此逐年面臨人力老化、後繼無人的隱憂。船舶中心也因應業者的需求，努力引進並開發新的智能工法，利用科技達到節約人力及精進效率的目標。至於面對一般船舶的挑戰，主要還在因應市場趨勢及國際法規的需求，目前的重點仍在環保節能上。

船舶產業屬資本、技術與人才密集產業，對人才的需求多元且廣泛，船舶中心對於人才培育也一向不遺餘力。

The shipbuilding industry is a capital, technological and labor intensive industry which requires talents with different backgrounds and various specialties. As a result, the SOIC has been sparing no effort in cultivating new talents.

Further Research and Development in the Entire Marine Industry

From assembly, original equipment manufacturer (OEM), to independent research and development, the Ship & Ocean Industries R&D Center (SOIC) has participated in each developmental stage of the entire domestic shipbuilding industry. Under national political objectives, the SOIC has made improvements in shipbuilding and ocean industries through constant accumulation of research & developmental capabilities.

Finding a Niche Market for the Ocean Industry

For the past 40 years, the SOIC has been focusing on the design and planning of various vessels, including merchant ships, official ships, yachts and naval ships. In response to the requirements from the Ministry of Economic Affairs in 2011, the name of the "United Ship Design & Development Center (USDDC)" was transformed into the "Ship & Ocean Industries R&D Center (SOIC)". Research and development of the entire ocean industry was formally incorporated after the change, to expand from being an exclusive R&D of the shipbuilding industry.

In order to make sure that the domestic industry does not fall behind its competitors in a vigorously competitive market, the SOIC has devoted resources as well as research and design to marine engineering vessels as a first step for gaining access to the entire marine industry. By assisting with transitions and upgrades in the shipbuilding industries, the internal demand for marine industries can be stabilized while external orders can be secured.

Look Forwards to a New Domain & New Technics

Since environmental protection has become a popular trend, green energy and clean energy have also become two major emerging industries that various countries have been constantly developing and competing for. By accompanying domestic industries to go through each developmental stage, the SOIC estimated that under current conditions, where our government has devoted great efforts in establishing offshore wind turbines, marine engineering ships will become the next new challenge for the domestic shipbuilding industry. From exploration, construction, to various maintenance and repair engineering after formal operations, all kinds of marine engineering ships are inevitable for these practical processes.

Despite the fact that the domestic yacht industry is well renowned, customized craftsmanship from experienced artisans was heavily relied on. Faced with the critical problem of an ageing population, the SOIC has introduced and developed intelligent craftsmanship in response to the increasing business demands. Through advanced technologies, human capital is saved while overall efficiency is raised. As to the challenges from merchant ships, environmental protection is perceived as the most important part in response to market trends and international laws and regulations requirements.

船舶中心業務屬性區分為設計、研發、監造，透過深入業者需求可掌握市場需求趨勢與競爭態勢。

The SOIC has established its R&D Department, which is separated into design, R&D and supervision & building sectors based on the services they provide. By investigating customer demands, information on current market trends and current competition trends can be comprehensively acquired.

船舶人才的創新研發基地

船舶產業屬資本、技術與人才密集產業，對人才的需求多元且廣泛。船舶中心在協助產業技術扎根、升級過程中，對於人才培育也一向不遺餘力。透過與各界密切交流互動，培養同仁全能宏觀的視野，研發部門著重創新思維，而創新必須落實於產業需求。為此，船舶中心有設計、監造、研發等業務方向，同儕間透過橫向連繫，可掌握市場需求趨勢和競爭態勢。透過了解所欠缺的研發能量或回饋實務經驗，避免同仁閉門造車，研發方向曲高和寡、落實不易。

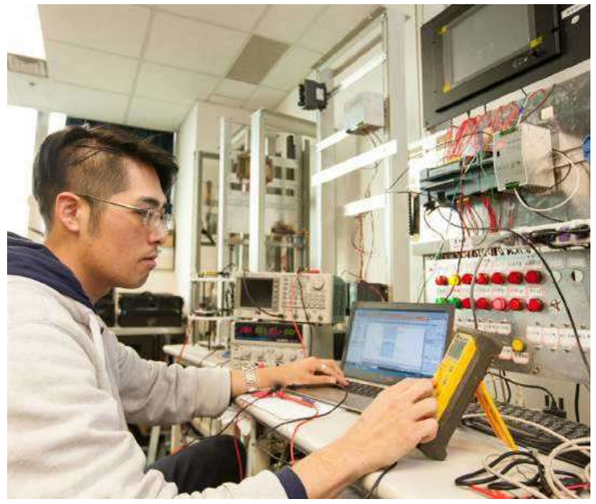
近年來船舶中心也致力營造開放的風氣，一方面積極發掘具有潛能的同仁，另一方面透過各種獎勵措施鼓勵創新，甚至提供嘗試錯誤的機會，讓同仁放膽從做中學，更進一步從失敗中獲取寶貴經驗。民國 70 年代為引進貨櫃輪設計能量，船舶中心曾派出團隊赴德國見習，目前為汲取國際間海洋產業的發展實務經驗，將有另一波海外學習潮。

由於船舶中心具備理論扎實、實務優化、學習機會多元、經驗豐富等優勢，觸角既深且廣，船舶中心人才在業界向來炙手可熱，被延攬至航運公司、船廠或學術單位、教學單位者表現亦可圈可點。作為產業的夥伴及國家政策的執行者，船舶中心的人才擴散效應，也是對產業、對國家的另一種貢獻。

科專計畫深耕研發沃土

船舶中心引領國內船舶設計走向，於迎接新世代的同時，研發是永遠的挑戰，也是船舶及海洋產業能否輝煌的命脈所繫。船舶中心衡政策走向，獲各項科專計劃支持，在深耕研發的同時，對於前瞻的研究成果能否符合經濟效益、產業效益亦是念茲在茲；同時也以服務業者需求為己任，期使在符合趨勢、需求與法規的前提下，不負客戶所託。

船舶需求與國際經貿息息相關，於風雲詭譎的國際情勢中，船舶中心



船舶中心也因業者的需求，協助開發新智能技術，利用科技達到節約人力及精進效率的目標。

To meet the customers' demands, SOIC has also helped develop smart technologies to achieve the ultimate goal of saving manpower and improving efficiency at the same time.

歷經了 2 次減薪的危機，最終都在同仁同舟共濟與政府的支持下度過難關。風險與挑戰永遠是激勵向前的動力，面對未來除了在一般船舶及遊艇設計上精益求精外，國艦國造與海事工程船將是未來兩大挑戰，這 2 個區塊均需龐大投資，為國家未來的重點政策推動方向，攸關產業榮枯，船舶中心將責無旁貸，持續肩負著領頭羊角色，一秉初衷與產業共榮共存。

此外，環保、綠能、安全與智能化，是新一代船舶的共同要求，也是船舶中心研發上的重要課題。研發永無止境，協助國內產業轉型升級，提升附加價值，帶動國家在船舶及海洋產業的競爭力，是船舶中心永恆不變，最核心的價值與使命！SOIC

運用科技專案計畫，開拓政府與產業交流，擘畫臺灣船舶及海洋產業發展藍圖。

Based on the Science and Technology Development Plan, exchanges and communications between government and domestic industries are facilitated to draw the developmental blueprint for the entire ocean industries in Taiwan.

A Foundation for Further Research and Development

The shipbuilding industry is a capital, technological and labor intensive industry which require talents with different backgrounds and various specialties. As a result, the SOIC has been sparing no effort in cultivating new talents. Through trans-disciplinary exchanges and inter-actions, our staff's horizons are broadly widened. Since the R&D department puts a great emphasis on creative thinking (which must be later applied to meet practical industrial demands) the SOIC has established various departments such as the design department, supervisory department and R&D department. Through horizontal communication between the different departments, current market trends and competition status can be comprehended.

In order to introduce container design capability back in 1980, the SOIC has assigned a mission team to Germany for onsite studies. Currently, in order to absorb practical experiences developed from international marine industries, some other missions are estimated to be sent aboard for further studies.

Playing a double role of industrial partner and national policy executor, the SOIC has distributed its talents far and wide to contribute to the entire industry and nation as a whole.

Taking Part in Science and Technology Development Plans

In addition to improving merchant ship and yacht design in the future, indigenous domestic submarines (IDS) and marine engineering vessels will become the two major challenges the SOIC has to face.

In addition, environmental protection, green energy, safety, and intelligent technology are the common requirements for ships of the next generation, as well as a main issue for the SOIC to make further improvements.

船舶中心
研發亮點突破創新

精彩可期　產業技術穩步升級

作為臺灣船舶海洋產業發展的領頭羊，船舶中心與市場需求並肩，研發計畫既實用且具高度發展性，亦秉持永續發展之精神，搭上綠能、低碳、智能化生產等世界趨勢，自遊艇生產管理模組化、電動船舶，至離岸風電、複合動力船舶……等，推動研發不遺餘力。

亮點 1　遊艇生產管理模組化及智能化

從早期漁船及小型遊艇到巨型豪華遊艇的開發，船舶中心遊艇產業處本著專業技術與服務，作為產業發展的基礎，未來將以「生產力4.0」概念，導入內裝模組化設計，並結合 CNC 設備及專業家具廠之能量，進行家具之拆解與組合，以專業分工與水平整合，建立新世代生產工法，提升遊艇廠生產效率與內裝品質，使業者具備與國際遊艇大國同樣的生產模式，以同步工程結合模組化及智能化之生產製程，全面提升臺灣遊艇產業競爭力。

船舶中心未來與大型家具廠攜手研擬 CNC 技術，使遊艇內裝朝模組化、智能化發展。

The SOIC is working with large furniture plants for CNC technique development to enable modular and intelligent yacht upholstery.

遊艇內裝須考慮輕量化、曲面等設計工法，難度甚高。

Yacht upholstery mandates lightweight and curved design and craftsmanship and so are very demanding. Innovative Breakthroughs

導入關鍵技術並專注開發

早年臺灣漁船與遊艇設計能力不足，業者通常參考國外設計圖或改裝模具來因應市場需求，以致性能產生問題。為此，船舶中心於民國 80 年（1991）7 月在本中心科技專案室下成立「遊艇漁船小組」，分別來自初步、結構、輪機及艤裝 4 領域同仁所組成，藉由政府科專計畫之資源，協助開發漁船與遊艇的船型及基本設計之相關技術，並將技術移轉給業者，業者再進行施工設計及後續建造。

民國 90 年代由於漁業枯竭及漁船限建，在漁船船型開發此一階段性任務完成後，遊艇漁船小組便專注於遊艇設計與技術開發。多年來陸續發展出 3D 造型設計、低阻力船型、應用 CFD 技術、高耐海性能技術、舒適性技術，以及結構與推進等核心技術，共開發出 16 種新船型，並移轉業者 40 家次，建造超過 395 艘以上遊艇。

SCRIMP™ 技轉提升造船實力

隨著科技與技術之進步及木頭材料缺乏，漁船及遊艇已由木造逐漸改為玻璃纖維，早期玻璃纖維製程是以人工手積層，在施作上品質會因人而異，除不易達成輕量化之目標外，其揮發性氣體對人體健康亦有影響。為此，船舶中心自國外引進「SCRIMP™」真空吸入式工法，以封閉式真空方式抽吸樹脂均勻流動，完成積層，可有效降低樹脂含量及提高玻璃纖維強度。此技術亦已順利移轉至遊艇業者，應用於各式船舶之製造。

近年來，遊艇漸趨大型化及巨型化發展，從 30 英尺、70 英尺、110 英尺發展至 236 英尺，船舶中心為配合業者大型化之需求，陸續開發各種高性能船型，逐年提高產值及附加價值。遊艇組於民國 100 年（2011）因政府政策而改制為遊艇產業處，轉型著重於綠能與遊憩載具開發工作。

積極推動法規符合實際需求

除了技術不斷提升之外，協助遊艇產業排除發展障礙及船舶法規修訂，也是船舶中心肩負之責任。目前國內「船舶法」為最高母法，其中設有客船、小船及遊艇專章，此外尚有「遊艇管理規則」、「客船管理規則」及「小船管理規則」等。交通部近年積

Innovation Breakthrough Highlights of the SOIC

As a leader in Taiwan's development of ship and ocean industries, the SOIC moves alongside market needs to emphasize the spirit of sustainable development by engaging in R&D of practical and highly develop-able ship-related products. It has spared no efforts in promoting the R&D of ship modular production management, electric vessels, offshore wind power, hybrid power vessels, etc. to be attuned to green energy, low-carbon, smart production and other world trends.

Spotlight 1: Yacht Production Management Modularization and Intelligentization

Implement Key Techniques and Focus on Development

Early on, Taiwan suffered from poor fishing boat and yacht design talent .Ships that were made by local manufacturers had scores of performance issues because of cloning foreign drawings or molds to meet market demands. To address this shortcoming, the SOIC created the "Yacht and Fishing Boat Team (YFBT)" in July 1991. The new organization, which reports to the "Tech Project Office," is composed of personnel from fields of preliminary, structure, marine and outfitting. With the resources from national tech programs, it sought to help develop fishing boat and yacht designs and to design basic, relevant techniques for transferring plans to 40 private sectors for subsequent design manufacturing.

The fisheries depletion and fishing vessel restrictions beginning in the 90s shifted the YFBT's efforts to yacht design and techniques developed after the fishing boat development tasks ended. With scores of core techniques, including 3D design, low resistance ships, CFD technology application, high seakeeping and comfort technology, and structure and propulsion technology, the team has since come up with 16 new ship forms and co-built more than 395 yachts by transferring required techniques to private sector manufacturers.

SCRIMP™ Technology Transfer for Better Shipbuilding Capacity

More and more fishing boats and yachts are now built with glass fibers rather than wood thanks to technological improvements and wood material shortages. Manual fiberglass lamination not only suffers from various quality issues due to craftsmanship level of individual operators and heavier weight but also imposes health problem with its volatile gases. The vacuum suction lamination method (SCRIMP™) imported by the SOIC enabled resins laminated with a uniform flow to enhance the strength and cut the use of glass fibers. The scrimp technique has been transferred to the private sector and employed in the manufacturing of a full array of vessels.

Yachts are now developing in the direction of large and even mega sizes, from 30 feet, 70 feet, 110 feet and now 236 feet. Facing this fashion trend, the SOIC has been developing scores of high performance ship forms and raising output and added-value. The team was reorganized into the Yacht Industry Department in 2011 to focus on green energy and recreation carrier development.

Advocate Practical Regulations

Further to the technology improvements, the SOIC is poised to help the yacht industry in removing development barriers and revising ship relevant regulations. "The Law of Ships" is the national basic law and has exclusive chapters on passenger vessels, boats and yacht. There are other specific regulations including "yacht management

船舶中心與南海遊艇廠合作國內首部複合動力遊艇— uGreen 42 HYBRID 優能 42 呎綠能私人遊艇。

The SOIC and Bluewater Yacht Builders Ltd. joined hands to build the first domestic hybrid yacht – uGreen42 Hybrid.

極進行船舶相關法規之修訂與調整，船舶中心亦積極配合提供專業意見，以使法規更趨合理及符合實際需求。

早期遊艇以外銷為主，如今則因海禁解除及法規鬆綁而開拓了內需市場。民國 100 年（2011），財政部針對內銷遊艇提出超過 300 萬元者需課徵奢侈稅之規定，船舶中心與遊艇公會四處奔走，並透過工業局召開跨部會議，於民國 104 年（2015）才將 300 萬元遊艇須徵收奢侈稅，爭取提高至 100 英尺以上遊艇才須課徵，使我國海上休閒活動發展更趨正常，此一措施亦將影響國內遊艇銷售及遊艇活動品質。

協助產業排除障礙

遊艇「下水」一直是業者的難題，由於遊艇大型化發展的結果，道路運輸及下水等皆成為業者困擾的問題，包括業者必須於深夜或凌晨進行運輸、道路障礙排除、拆裝沿路相關設施等，皆相當耗費時間且成本甚高。為解決此一產業共同問題，船舶中心乃對高雄小港臨海工業區及大發工業區之遊艇規劃共同運輸路線，排除紅綠燈號誌、燈桿、高壓電線及安全島等運輸障礙，以提高運輸效率。同時協助工業局於高雄臨海新村漁港建置可承載 300 公噸及總長度 150 英尺的遊艇專用下水設施，可節省業者成本及縮短交船工期，有利爭取外銷訂單。

取得市場認同並進入市場，是遊艇產業共同願望及努力方向，而擁有船級認證的遊艇更容易打進市場，尤其是歐盟。過去，各驗船協會在臺灣遊艇驗船市場大約是均分，業者請國外專家來台驗船，專家開出的缺失問題，業者常不知要如何改善，耗時耗工。為協助遊艇業者順利取得外銷認證，船舶中心與義大利驗船協會合作，授權船舶中心在臺灣進行遊艇驗證。船舶中心提供一條龍式的服務，除了提出缺失問題外並教導解決方法，節省業者非常多工時與成本。以往義大利驗船協會在臺灣僅有 10% 驗證服務之市占率，與船舶中心合作之後，目前已提高至 90% 驗證服務市占率。

船舶中心協助工業局建置遊艇專用下水設施，解決遊艇產業共同問題。

The SOIC worked with IDB to build a yacht exclusive ramp to solve the big headache to the industry.

發展新式內裝製程工法

遊艇宛如一座移動豪宅，沙發、吧台及廚具一應俱全，豪華內裝必須呈現舒適度與娛樂視聽功能，要如何營造內裝品味與質感兼具的奢華享受，正是遊艇高附加價值之所在。早期遊艇內裝幾乎仰賴有經驗的專業木工師傅手工打造，隨著老師傅逐漸高齡化，整合創新內裝工法便成為亟待接軌的課題。

與陸上家具裝潢不同，遊艇內裝必須考量曲面造型及輕量化、內裝背後之管路及電路配置，以及須考慮後續維修拆裝的空間等。此外，遊艇內裝尚需克服風浪所引起振動的影響，對於遊艇內裝家具的組合與銜接，不但要考慮船體變形的組裝工藝，還要做好振動噪音防制，因此複雜度與難度甚高。

國內遊艇多為客製化訂單，尤其是內裝家具部分，更須隨船主的喜好而更換，也造成業者翻工的困擾，為協助產業提升效率，船舶中心於民國 97 年（2008）開發 3D 遊艇內裝家具參數化資料庫，將內裝設計、家具組件的尺寸及規格，採參數化設計，只須調整要修改的參數，即可快速產生 3D 圖，有利於與客戶溝通及使船主提早決定下訂單。

目前船舶中心正以「生產力 4.0 計畫」之理念，推動整合 3D「內裝設計、自動化生產設備與拆解組合之數位平台」，運用資通訊電腦科技，建置內裝單元家具拆解組合技術，整合運用陸上家具業自動化設備資源，導入自動化製程分工，並以陸地生產、船上組裝的模式，以智慧自動化產業概念，改善製程、節省成本，以提高遊艇生產品質，以及提升遊艇產業整體競爭力。

遊艇內裝追求極致豪華，成本占遊艇整體40%，高附加價值正說明遊艇產業未來發展指標。

An extremely luxurious yacht interior design is an ultimate goal of the domestic industry. With costs accounting for 40% of the entire yacht, the high value-added is a developmental indicator for the entire yacht industry.

rules," "passenger ship management rules" and "boat management rules." Lately, the MOTC is acting on the revision and adjustment of relevant ship regulations. The SOIC is giving a helping hand on this by providing professional recommendations for more reasonable and actual demand-compliant codes.

Remove Industry Barriers by Walking in Its Shoes

Moving a yacht from dry dock to a water body is a big headache to the industry especially for large or mega size ones' transport and launch. Yacht makers are forced to spend a fortune in transporting a yacht at mid night, removing road barriers, removing and recovering facilities along the route. Addressing this problem, the SOIC has designed shared transport routes in

Linhai Industrial Park and Dafa Industrial Park in Kaohsiung which has many road barriers removed, including traffic lights, lamp poles, power lines and safety islands, for better efficiency. The SOIC also worked with IDB to build a yacht exclusive ramp at the Linhaixincun Fishing Harbor, Kaohsiung, facilitating yacht of displacement up to 300 tons and total lengths of up to 150 feet to get more exports sales with less costs and shorter lead time.

The yacht industry has been managing to get more recognition and enter more markets. Yachts certified by the classification society are easier to be sold in global markets especially the EU ones. Local yacht certification services are highly controlled by individual classification societies. Local manufacturers hired certification personnel who come to Taiwan, do the inspection, list out scores of defects to be remedied, and left the former with plenty of time and resources to deal with these problems. The SOIC worked with the Registro Italiano Navale (RINA) and received their license to certificate yachts in Taiwan. Integrated services provided by the SOIC not only identified flaws but also recommended solutions that saved local players a lot of time and money. RINA used to account for only 10% of the local certification market share. Now it takes up 90%.

Enhancement of Yacht Upholstery and the Development of New Processes

A yacht is nothing but an even more luxurious mansion floating on the sea. It mandates balanced luxury and comfort and AV entertainments. Build up stylish and tasteful upholstery design with eye watering experiences is where the added value counts.

Most domestic yachts are made to order, especially their upholstery and furniture that almost always have to be revised per the ship owners' preferences. This has led to many re-works in production. The SOIC started developing a yacht upholstery and furniture 3D parameter database in 2008. It parameterizes dimensions and specifications of the upholstery and furniture design to enable fast 3D modeling for easy communications with the customer and ship owners, and ultimately for early orders.

The SOIC is working on a 3D integrated "digital platform for upholstery design and automated production equipment mixing" based on the concept of the "productivity 4.0 program." The platform is aimed at employing information and communication computer technology, building up upholstery and unit furniture mixing techniques, integrating and applying land furniture industry's automated equipment resources and implementing an autonomous process division to improve the process and cut costs with land-based-production and yacht-based-assembling model and smart autonomous industry concept. The goal is to enhance yacht production quality and improve the yacht industry's overall competitiveness.

亮點 2 從陸域投入離岸的風電技術研究

綠色能源的使用，是未來的國際趨勢。船舶中心在船舶領域的長期發展下擁有螺槳與複合材料船舶設計、專案管理的豐厚經驗，考量研發能量的多元發展，降低產業發展的波段風險，並協助國內業者尋求新的產業轉型，船舶中心自民國 94 年（2005）起，藉由科技專案計畫的參與及申請，跨入風力機元件與離岸風場開發的研究領域。首先參與工業技術研究院主導的陸域風力發電機開發計畫，以風力機葉片做為研發主軸；民國 100 年（2011），船舶中心順應更名轉型後的定位，朝「海洋能源」方向發展，除風機葉片的研發從陸域轉向離岸，仰賴過去在船舶設計與專案管理的經驗，船舶中心將發展主軸著重於船隊規劃、施工船機設計規劃、海事工程安全評估等，期望能協助國內海事工程業界切入國內海洋能源之開發，對產業發展能有所助益。

離岸風機葉片研發技術升級

風力機葉片主要材料為複合材料，且其主流製程與遊艇之 SCRIMP™ 近似，船舶中心在能源局科專中與工研院合作開發長達 40m 之 2MW 級風力機葉片的設計技術，後續協助國內遊艇廠製造出實體葉片。此外，應用研發的技術，協助台電在國外原廠未提供設計資料的情況下，進行逆向工程、取得葉片設計的相關資訊，對其建立國內維修體系有相當大的助益。隨著風機的發展從陸域移往海上，風力機也因大型化之趨勢，提升至 5 ～ 6MW 的等級，葉片長度則高達 60m，故對輕量化之要求更為殷切，民國 98 年（2009）起，船舶中心開始投入離岸風機葉片的研發，導入碳纖維之設計技術，以進行高效率之結構配置設計。

中心開發之離岸風機葉片，朝大型化、輕量化趨勢發展。

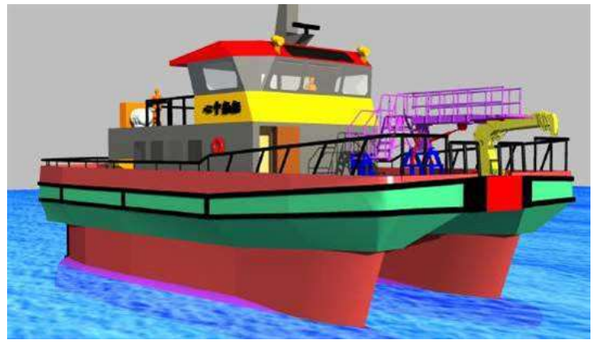
Offshore wind turbine blades are moving towards larger and lighter weight design.

建立離岸風能工程實力

離岸風場與陸域風場最大的不同處在於離岸風機之運輸、安裝都在海上進行，離岸風機相關元件體積巨大，若要運送至海上安裝，需要整合基地母港、拖船、自升式平台船、鋪纜船等特殊船機及吊車等相關設備，並要克服海象的變化。有鑑於國內產業界尚缺乏離岸風場專案管理與海事工程的相關經驗，船舶中心透過不同的科技專案，建立離岸風場專案管理與海事工程相關的技術能量。

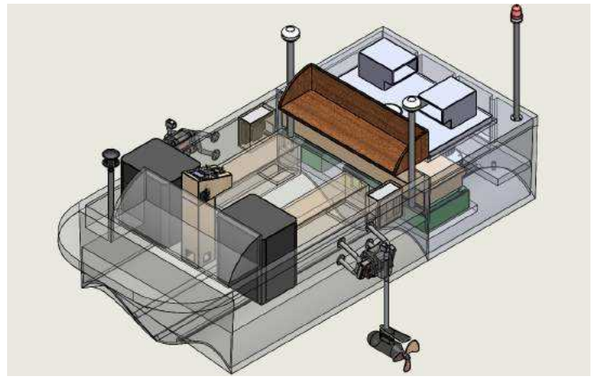
船舶中心自荷蘭引進之海上施工船機，為離岸風機作業之規劃重點。

The marine engineering vessel imported from the Netherlands by the SOIC it key to offshore wind turbine operations.



船舶中心針對「高耐海性能人員運輸船技術開發計畫」研發之小水面雙體船，能適應臺灣海況及港口特性。

The twin hull vessel by the SOIC addressing a “highly sea keeping passenger vessel technology development program” is ideal for water bodies and ports in Taiwan.



船舶動態定位系統連結艉、側推進系統、馬達驅動器、電池組、直流發電機等各式感測器，可精密掌握海況資訊，未來可應用於精準拋石船及佈纜船，有效降低離岸風場建置及維運成本。

Working with a stern and side propulsion system, motor driver, battery pack, DC generator and scores of sensors, the dynamic vessel positioning system makes the best of sea state information for precision ocean riprap and cabling to cut offshore windfarm buildup and operation and maintenance cost.

・「工業合作計畫」（經濟部工業局，民國 101 ～ 104 年）

工業合作為國家移轉外國關鍵科技的重要管道，船舶中心參與的工業合作計畫有「離岸風場開發規劃技術」及「風機安裝暨維修平台船工程技術」。在離岸風場開發規劃計畫方面，船舶中心自民國 101 年（2012）起由丹麥 NIRAS 及英國 TWI 處進行技術移轉，內容涵蓋離岸風場開發中，規劃設計、計畫管理與水下結構營運維護之相關技術，船舶中心建立了因應風機設置地點、環境條件之風資源評估技術，以確認風場開發專案之經濟效益，並發展風場初階設計、計劃管理、工程風險評估等相關技術，相

Spotlight 2: Technology Research From Onshore to Offshore Wind Power

Technology Upgrades from Wind Turbine Blades R&D

Composite materials are adopted as the main materials for wind turbine blades and the manufacturing process for blades is similar to that for yacht structures. The SOIC cooperated with ITRI to develop the 40m 2MW wind turbine blades and assisted the domestic yacht builder to manufacture. From experience, the SOIC helped Taipower Company obtain the design data using reverse engineering under the circumstances that original equipment manufacturer did not reveal the data. The domestic O&M system can be established accordingly. Following the development of wind turbines from onshore to offshore, the SOIC has started to engage in the R&D of “Offshore Wind Turbine Blades” since 2009. The trend on large wind turbines of 5~6MW level has prompted the development of blade length of up to 60m, and the blade materials have also been upgraded from glass fiber to carbon fiber.

Establish Offshore Wind Turbine Engineering Capabilities

The main difference between the onshore and offshore construction is that the activities related to transportation and installation are processed at sea. As the relevant offshore wind turbine components are bulky, if they need to be installed offshore, the port, tugboats, jack-up vessels, cable laying vessels and other special equipment should be integrated. In addition, sea climate changes should be also overcome. In view of the domestic industry still lack the experiences in marine operation and project management in offshore wind farm development; the SOIC has established the technical capabilities on offshore wind farm and marine engineering through undertaking various technology projects.

•“Industrial Cooperation Program” (Industrial Development Bureau, Ministry of Economic Affairs, 2012~2014)

Industrial Cooperation Program (ICP) is an important resource for technology transfer. The SOIC had participated the ICP projects “Offshore Wind Farm Development Technology” and “System Integration and Ship Design for Wind Turbine Installation Vessel (WTIV)”. With regard to project involving the offshore wind farm development, the SOIC has transferred technologies from Denmark-based company NIRAS and UK-based institute TWI, and established wind resource assessment technology in response to wind turbine installation locations and environmental conditions, and also established the wind farm preliminary design, project management and other related technologies. The technologies established were applied to serve the domestic developers and marine contractors. With regard to the design technology of WTIV, the SOIC had obtained the design technology in Jackup Vessels from Dutch-based company IHC from 2014. From this project, a working vessel capable of carrying two wind turbines in one trip was developed. This has actively fulfilled the localization goal to build workboats on our own.

•“Technology Development of Offshore Wind Turbine Related Vessels” (Department of Industrial Technology, Ministry of Economic Affairs, 2013~2015)

Offshore working vessels are featured in the special design to install wind turbines stably and precisely. The R&D focus of SOIC is “jack-up vessel”. After sailing to the site, support legs of the vessel can insert vertically into the seabed to raise the platform, and avoid wave interference to piling and installing processes. If the soil capacities cannot bear the support legs, the soils will be penetrated by spudcans and the platform will be unstable. The SOIC developed the relevant analysis and evaluation technology to make sure the safety working.

As the crews perform the installation and maintenance operations, they need to land on the wind turbine. However, it is very difficult and dangerous to jump from the

水下溫鹽密度儀及水下監控系統使現場工作人員能掌握精確資訊。

Through the R&D of underwater environmental monitoring technology, the SOIC is able to allow construction workers to master onsite hydrological and other information precisely.

關成果已陸續應用於國內離岸風場開發商與海事工程商，如福海風場之細部場址評估。而在安裝維修平台船部分，船舶中心於民國 103 年（2014）起引進荷蘭 IHC 的自升式平台船設計分析技術，可一次載運 2 組 5～6MW 風力機，現正積極推動施工船本土建造的目標。

・「離岸風電關聯船機技術開發計畫」（經濟部技術處，民國 102 ～ 104 年）

離岸施工船不同於一般的船舶，需要特殊設計來輔助安裝工程穩定、精密地進行。船機技術上，船舶中心研發重點的「自升式平台安裝船」，在航行至作業地點後，其上之支撐腳可垂直插入海床、升起平台，以使設在平台上的海上吊車能在避開風浪的拍打干擾下，進行風機基座的打樁與風力機的安裝作業；其中，支撐腳插入海床時，若海床土質無法承受平台巨大的預壓力，支撐腳即會發生貫穿土壤現象，導致施工平台失穩傾倒，故船舶中心開發相關之分析與評估技術，以確保施工安全。

人員進出離岸風機進行安裝或維護作業時，要先登上塔架，然而要由在海面上隨波浪上下運動的運輸船，登上靜止的風力機塔架，將隨著風浪增大益顯困難及危險，況且為符合風場營運效率，在風力機可滿載發電、強風大浪之季節，維修人員必要時亦需出海登塔作業，因此如何設計一款耐浪性佳且運動量小的船型將是一大重要課題。「高耐海性能人員運輸船技術開發計畫」則是因應台灣海況及港口特性，藉由船型選擇、阻力優化分析、耐海性試驗、安全登塔梯系統運動補償分析技術之開發，研發出適合風機維修與檢查作業人員所搭乘的雙體船。

在海上組裝風力機元件為一相當精細的作業，考量離岸風機安裝過程中，作業船首要精確的定位到預定施工位置，故動態定位系統已為離岸風機安裝船必備之系統，唯國內目前無廠商生產該產品，因此船舶中心進行「船舶動態定位系統」之開發，結合 DGPS、風向風速計及運動感測器，經相關控制器計算推進命令，以控制不同方向的螺槳、維持施工船在海上的位置。

離岸風場的海氣象觀測塔必須具備水下觀測儀器，以進行海洋環境（波浪、海流、海水鹽溫深度、潮位）之紀錄與監控，船舶中心開發「水下環境監控技術」，利用水下連接器之節點技術，整合跨廠牌的水下儀器如水下噪音計、海底地震儀等，並採用光纖與電力的水下複合電纜，以實現超長距離傳輸電力與資料之能力，讓施工人員能夠精密掌握施作現場的水文、地理、生物等資訊。

・「離岸風場作業安全評估技術開發計畫」（經濟部能源局，民國 103 ～ 105 年）

離岸風電海事工程的複雜度遠遠超過陸上風電建置工程，亦隱含安全上的隱憂，故先進海事工程國家在作業前，施工船機乃至於施工工法均需通過海事擔保調查（marine warranty survey）等第三方之認證，以確認施工規劃能達到基本之安全標準；現階段國內在施工工法之安全評估技術與海事工程認證體系方面的技術能量尚待建立，故船舶中心藉由「離岸風場作業安全評估技術開發計畫」發展相關之安全評估技術，以事前分析海事作業方式之可行性，舉凡風力機元件裝載過程之船舶穩度、施工船適航性評估、運輸過程元件之固定狀況、海上安裝時之吊裝模擬、打樁機具與樁體、地質條件之搭配等技術均為開發重點；期能在依循國際法規所建構的安全評估基本模式上，協助國內海事施工團隊事前掌握船舶與機具之適用性，並評估各項作業之安全性與可行性，以切入國內離岸風場之建置施工。

地理資訊系統（Geographic Information System，GIS）的應用已遍及與地理空間有關的各項領域，離岸風場開發具有區域設置範圍大、專案執行時間長、工程介面眾多等特性，故有效率的 GIS 系統將對離岸風場各開發階段之專案管理有相當大的助益，船舶中心於「離岸風場海事工程施工管理平台技術開發」中，開發以 GIS 為基礎，整合離岸風場各項地理圖資、船舶動態位置、人員落海警示之施工管理系統。

自民國 103 年（2014）起，船舶中心已陸續協助台船及宏華分別針對福海與台電風場之海氣象觀測塔運輸作業進行安全分析，也透過移轉給中鋼公司之「海事工程施工管理平台」技術，確保工程安全並有效率地進行，本年度正協助穩晉通過海洋風場鋪纜作業的海事擔保調查（MWS）認證。

建立自主能力突破競爭僵局

從陸上風機葉片走向海上風場開發相關船機與海事工程評估技術的研發，船舶中心竭力輔導國內廠商承接相關業務，不僅提升國內離岸風電的技術能量，也希望帶起相關產業鏈，隨國內離岸示範風場之開發建置，後續船舶中心將持續發展離岸風場開發與維運之相關技術，建置精準拋石護樁船循跡操控技術及船艏安全登塔系統原型，並在未來技術成熟後，有計劃地朝「浮動式離岸風機平台」之發展方向邁進，提升技術能量，協助國內進一步開發豐沛的海洋能源。

moving vessels to the stationary wind turbine. Even if the environmental condition is very harsh, the crews still need to work at sea for the economic consideration. Therefore, a wave-resisted and motion-reduced vessel is necessary. The R&D on "Technology Development for High Seakeeping Crew Transfer Vessel" is focused on a catamaran suitable of Taiwan's sea conditions and port characteristics to ease the inspectors to perform wind turbine maintenance operation.

Considering the offshore installation is a very precise process, the working vessel should be led to the planned location. A dynamic positioning system is a requirement for offshore wind turbine installation vessel. The SOIC has also developed the "dynamic positioning system for vessels." Through the DGPS, anemometer, motion sensors and relevant control schemes, the vessel can be maintained in the same location by propellers moving in different directions.

The met mast should be equipped with underwater monitoring instruments to record the ocean environmental conditions, including wave, current and tidal etc. SOIC develops the underwater environmental monitoring technology, using the junction box to integrate the different instruments such as underwater sound lever meter, ocean bottom seismographs and utilize the optical fiber and underwater composite cable to transfer data in long distance. From this system, working staff can obtain onsite hydrological, physical properties, biological and other information precisely.

•"Development of Safety Evaluation Technology for the Offshore Wind Farm Construction" (Bureau of Energy, Ministry of Economic Affairs, 2014~2016)

Safety is the biggest challenge for offshore wind turbines during marine operations such as transportation, lifting, piling, installation, operation and maintenance. For European countries, the working vessels, equipment and proposed procedures should be certified by the third party called Marine Warranty Survey (MWS) to validate whether the construction planning can fulfill the safety demands. In Taiwan, the capabilities for safety assessment are not fully established. For this reason, SOIC has set up safety assessment technology that complies with the requirements proposed in international guidelines. The key technologies include vessel stability, cargo sea fastening, marine lifting analysis, and piling process simulation. It is expected that the capabilities of domestic marine industries can be upgraded and the opportunities for taking the international marine works can be increased.

Geographic Information System (GIS) is applied broadly in several fields. The features of offshore wind farm development include the large deployment zones, long project life, and various engineering interfaces. Effective GIS system can benefit in every stage of development. SOIC develops the GIS-based construction management system, which integrates the geographic information, vessel dynamic location data and crews safety reporting systems.

Since 2014, the SOIC has gradually assisted Fuhai and Taipower offshore wind farm to perform safety evaluation during met mast installation. By technology transferring construction management system, SOIC helped China Steel Corp. to working in high efficiency and safety. Currently, SOIC is helping Woen Jinn Harbor Co. to receive the MWS certificates for the cable laying process of Formosa offshore wind farm.

Autonomy Establishment to Create Competitive Breakthroughs

The SOIC is striving to upgrade the quality and technology capability of domestic offshore wind turbines and bring up the related industrial chain. Follow up, the SOIC will continue to enhance the relevant technologies of offshore wind farm development and O&M, build falling pipe vessel tracking technology and prototype of turbine access system, and plan to move towards the development path of "offshore wind turbine floating platform." to explore the plentiful ocean energy.

亮點 3 船舶複合動力成未來趨勢

礙於長期趨勢，石油仍有日益高漲的身價，汽車界早已投入油電混合技術的研發。傳統船舶引擎有著耗油、振動大的缺點，在綠能、節能當道的時代，複合動力成了船舶新興發展趨勢。

複合動力展現高經濟效益

電力推進系統具有低噪音、低振動的特性，早期在國外主要應用於大型船舶如郵輪等，以及強調隱密性的軍事船艦上。如今，因應綠能環保的需求，也成為小型船舶的發展主軸。

國內的電推系統發展起步較晚，但零組件技術已臻成熟，並朝小型化專用系統發展，有別於大型電推系統，小型化的電推系統需要更多高科技技術加持，才能縮小體積、提高效率、輕量化，以對應巴士、遊艇、汽車等交通載具的需求。

現行技術水準，已經能將小型電推系統的總重量降至傳統引擎的一半，國外已普遍應用在渡輪、帆船等各型載具上。例如 2016 台灣遊艇展的 Aquasense 33 Hybrid，由船舶中心設計全自動化複合動力能源控制程序，大舟遊艇製造流線古典船型結構，以及長岡機電負責馬達模組製作的全國產化複合動力快艇。該船是臺灣第一台完整利用臺灣機電產業優勢與船舶製造技術，所推出具有國際競爭力的新世代豪華快艇產品。該船配備 2 部與 25kW 馬達整合之 260HP YANMAR 牌高速共軌式柴油引擎，以及可以進行 1.5 小時快速充電與最高 15kW 船上電源供應的高效能機電設備，另外該船也配備有達 23kWh 的鋰電池設備，可供應該船在純電模式下以 7 節航行 30 分鐘。

本系統使用的馬達是採用電動車產業最先進的 IPM（Interior Permanent Magnet）內藏式永磁馬達，該馬達與引擎接合機構之處採用了可以承受高轉速差的電磁式離合器，可以將引擎運作動力完整與馬達結合，提升複合控制的效能。

The interior permanent magnet motor, the most advanced one in the electric car industry, employed by this system features an electromagnetic clutch to connect it to the engine. This improves hybrid control performance by seamless integrating power of both.

Aquasense 33 Hybrid 為首艘完整利用臺灣機電產業優勢與船舶製造技術之全國產化複合動力快艇。

Aquasense 33 Hybrid: the first fully localized hybrid power boat taming domestic M&E industry strength and shipbuilding technology.

未來，船舶中心期望扮演系統整合的角色，藉國內零組件開發商及模組製造商之力，打造優良船舶產業環境及國際競爭力。

The SOIC is aiming to act as a system integrator to build up a good shipbuilding industry environment and global competitiveness by integrating local components developers and module manufacturing.

電動船研發勢在必行

在國際公約、環境保護法雙雙對船舶廢氣排放的限制之下，國內外許多內陸水域（湖泊、水庫）及限制水域（港區潟湖）早已限制船舶使用燃油引擎的數量。技術處自民國 99 年（2010）起開始支持船舶中心發展船舶複合動力的技術開發與系統效益評估，透過船舶中心輔導與技術轉移，協助許多國內小型造船廠發展製造電動船，日月潭與愛河的電動遊客船及水庫的電動巡邏艇，都是顯著的成績。

船舶油電複合動力的經濟價值凌越環保價值，若納入電池技術，依照不同營運需求與特性會有不同效果。現今其他國家的拖船、離岸海事工作船已經開始採用複合動力整合的系統，研發觸角往下一世代邁進。

搶占國際電動船市場先機

電動車近年來的快速發展，導致系統零件大幅降價，連帶牽動電動船的發展腳步加速。但汽車與船舶在電力系統的使用上，功率、負載、驅動方式均不同，就連設備供應鏈也大不同。

船舶中心未來預計扮演系統整合（SI）的關鍵角色，讓國內零組件開發商及模組製造商順利加入船舶電力推進系統的開發團隊。此外，針對電池廠商，船舶中心也積極協助取得船級協會的安全認證。

為了強化整體研發的實力，船舶中心也整合了國際、在地廠商及學界，組成「亞太區高階電力推進船舶研發團隊」，未來將以高雄港作為製造測試的基地。首要就是將旗津渡輪電動化，結合原本的陸上輕軌，串接完整的綠能交通動線。此計畫也預計替高雄港周邊造船業注入新的能量，帶動另一波船舶產業的發展。SOIC

Spotlight 3: Hybrid Power Vessels are the Future Trend

Hybrid Power With High Economic Efficiency

Electric propulsion system features the characteristics of low noise and low vibration, and had been used extensively in overseas large vessels such as merchant ships, cruise ships, and even military ships that emphasize stealth performance in the early days. Today, in response to green energy and environmental protection requirements, it has also become the development focus on small vessels.

The development of domestic electric propulsion system is moving towards minimization that requires more support from higher technologies in order to achieve the goals of compact, lightweight and better efficiency.

The current technological level is able to reduce the total weight of small electric propulsion system into half the weight of traditional engines. They have already been used extensively in ferries, sail boats and various workboats.

R&D on Electric Vessels is the First Priority

Under the restrictions of International Conventions and Environmental Protection Act on ship emissions, many domestic inland waters (lakes, reservoirs) and restricted waters (ports, lagoons) have already prohibited the use of fuel engines. Since 2010, SOIC has been conducting relevant studies on vessel hybrid power to assist many domestic small shipbuilders to develop electric vessels. Examples are electric sightseeing boats at Sun Moon Lake and Lover River, and electric patrol boats.

When using gasoline-electric hybrid power in dynamic stabilization system of vessels, it is able to reduce fuel consumption by 35% and cut waste emissions by 60%. The performances are indeed outstanding.

Seize the International Electric Vessels Market

There has been a rapid development of electric vehicles in recent years. However, as compared with automobiles, the propulsion system of vessels is not the same in terms of application, power, load and drive mode, not to mention a great difference in equipment supply chain also.

In the future, SOIC expects to play the role of system integration (SI), allowing domestic component developers and module manufacturers to happily join in the development team of vessel electric propulsion system. In addition, for battery manufacturers, SOIC is also actively helping them to acquire safety certification from Classification Societies.

To strengthen the overall R&D capability, SOIC has also integrated the international and domestic manufacturers and academia to form “R&D Center of Asia Pacific High-end Electric Propulsion Vessels.” Kaohsiung Port will be chosen as the building and testing base in the future. The primary move is the electrification of Cijin ferry service. This is expected to inject new energy into the peripheral shipbuilding industry of Kaohsiung Port and bring in another wave of development for the shipbuilding industry.

品質 Quality

臺灣的造船業，從設計、製造、到認證，整體品質與實力與國際接軌，贏得不少國外商船、漁船、遊艇、及軍艦的訂單。傑出的成績，仰賴的是船舶中心 40 年來持續不斷的努力。

除了在設計研發上精進，船舶中心更在產、官、學、研各界之間扮演媒合鏈結的重要角色，在輔導造船業升級同時，也尋求多元跨域的可能性。多方努力之下，讓臺灣造船業成功轉型成為精緻、專業、設計導向的高精密產業，在國際造船舞台上佔有相當重要的一席之地。

「精益求精」4 字，便是船舶中心的最佳寫照。

Since the design, manufacture, certification, overall quality and capability of the Taiwanese shipbuilding industry have begun to gain global recognition and praise, foreign orders for merchant ships, fishing boats, yachts and naval ships have increased as well. The excellent business performance is attributable to the constant devotion and commitment of the Ship and Ocean Industries R&D Center (SOIC) over the past 40 years.

Aside from constant improvement in research and development, the SOIC also plays an important role as a centralized organizer among various groups, particularly among industrial circles, political circles, academic circles and R&D circles. At the same time as assisting with the continual development of the domestic shipbuilding industry, the SOIC also constantly seeks business opportunities for trans-disciplinary collaboration. Under this collaborative relationship, the shipbuilding industry in Taiwan has been gradually transformed into an efficient, professional and design-oriented industry, taking up an important role in the global shipbuilding community.

As a result, “Constant Improvement” has become the best description for the SOIC.

優異設計服務 名揚四海

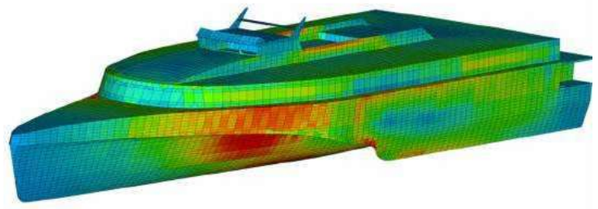
邁開船舶海洋產業自信步伐

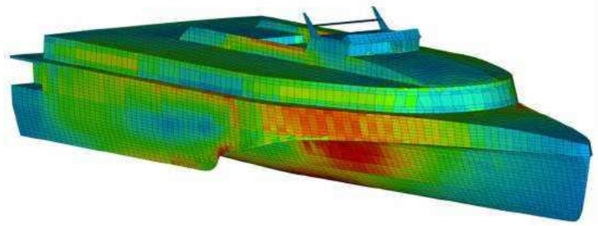
船舶中心以協助產業升級為己任，歷經 40 年深耕船舶設計領域，透過設計服務與技術服務，成為客戶最佳合作夥伴，並逐步發展為臺灣船舶設計研發與資訊整合中心，為促進整體造船工業與海洋產業發展蓄積了更大能量。

40 年來，船舶中心傾心盡力，積極參與航運界、造船界與軍方船艦之運作實務。

Even 40 years after the foundation of the SOIC, the SOIC continues to actively participate in the practical affairs of ship operations in the shipping, ship building and the military field with great enthusiasm.

打造一艘船所費不貲，為確保這項投資準確無誤，廠商在造船前會先進行可行性評估，確認可行後，再從事後續設計步驟，直到合約設計圖完成，船廠再據此進行相關的裝備採購，並依自身的造船工序產出施工設計圖。





在扶植產業發展的使命下，船舶設計遂成為船舶中心的主要任務之一。

Under the mission of promoting the industrial development, designing ships has become one of the major tasks of the SOIC.

設計服務　為客戶量身打造

國內船廠規模大小不一，大如台船者，目前由前端的可行性評估到建造船舶，已有能力一手完成；至於中小型規模船廠，有的已擁有前端設計的關鍵技術，但囿於人力物力資源不足，通常只限於某些特定類型的船舶設計；而小型船廠則專注於後端建造工程，設計範疇則多委外進行。因此，廠商是否獨立進行設計或由船舶中心輔導設計，主要考量因素乃繫於廠商本身是否有足夠的設計能力。

在扶植產業發展的使命下，船舶設計遂成為本中心的主要任務之一。設計服務包括 4 大階段：

一、**可行性評估：**根據客戶的預算與資源，以及工程實務考量，評估不同設計構想的優劣與可行性，由於一切仍在發想階段，因此也稱為概念性設計。

二、**規劃設計：**依客戶的造船構想、船舶類型、功能性能等主要需求條件，提供含有船舶佈置規劃、主要需求規範、裝備規格等設計圖說資料。船廠可據此估算較精確的建造成本，再進行後續設計。

三、**基本設計：**涵蓋船舶基本計算、船體結構、艤裝、輪機、電機等方面的規範與設計，表達了船舶基本性能、構造材質與寸法、設備系統、功能與佈置、施工基準等。基本設計圖必須通過船級協會與航政主管機關審查，並為後續施工設計的主要依據。

四、**合約設計：**從可行性研究、構想設計、船型規劃、報價、基本設計……等，通過層層縝密的構思與驗證，最後所產出的船舶建造規範即是合約設計，可說是船舶中心設計服務的核心。船廠則根據此設計圖產出更細部的施工設計。

Design Service Obtains a Good Reputation over the World

There are many ship manufacturers of various scales in Taiwan. Larger ship manufacturers, such as the Taiwan Shipbuilding Corporation (TSBC), can control the whole process, from the initial feasibility assessments to the ship manufacturing. Small to medium ship manufacturers, on the other hand, have already begun front-end designs of key techniques. However, as those manufacturers are limited by manpower and resources, they can only design some specific types of ships. With small ship manufacturers, they focus on the rear-end building construction and usually contract out its design.

Pragmatic and Innovative Design Services

Accordingly, the major factor determining whether a company performs a design or receives assistance from the Ship and Ocean Industries R&D Center (SOIC) depends on whether the company has enough design capabilities.

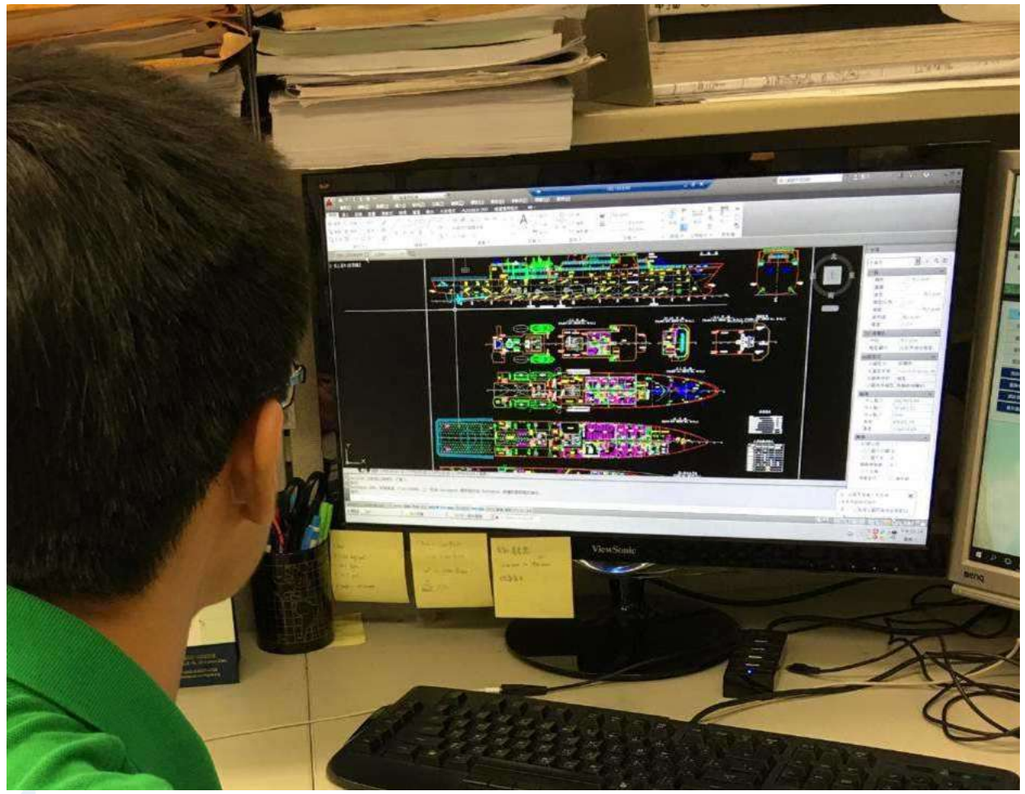
Determined to promote industry development, the designing of ships has become one of the primary tasks of the SOIC. The SOIC's design service includes four major stages:

1. Feasibility assessment: The object of the feasibility assessment is to access whether the concept is feasible according to the budget and the resources of the ship manufacturer. At this stage, the entire ship design concept is under the concept development stage, which is also called the conceptual design phase.

2. Planning design: The objective of planning designs is to provide drawings and data, including the ship arrangement planning, major requirement regulations, equipment specifications and the like according to the customer's major requirement conditions, such as ship building ideas, ship type, functions and performance, etc. Afterwards, the ship manufacturer can assess more accurate building costs based on the information above and then proceed with the design process.

3. Basic design: Basic designs include the regulations and designs of basic ship calculations, ship body structure, outfitting, marine engine, electrical machines and the like to show the basic ship performance, structure, materials, dimension, equipment system, function, arrangement and building standards, etc. The basic design diagram should pass the examinations of the Classification Societies and office of maritime administration and then serve as the major basis for the design in the future.

4. Contract design: After a series of planning sessions and verifications – from feasibility research, idea design, ship type design, quotation, basic design and the like –



合約設計即是從可行性研究、構想設計、船型規劃、報價設計、基本設計，通過層層縝密的構思與驗證，最後所產出的船舶建造規範。

From feasibility research, idea design, ship type design, quotation, design basic design and the like, the finally finished ship building regulations are the contract design.

專案管理　滿足全方位需求

船舶中心的設計服務除上述階段性的服務外，並提供專案管理，以整合式服務滿足客戶全方位的需求。主要內容包括船舶招標作業、規範審查與討論以及技術服務等。

招標作業方面：可提供招標公告、招標須知、建造契約草案、投標文件審查等服務；審圖服務是根據船東需求，協助審核各種設計圖、施工圖、裝備廠家圖說、及主要造船時程的施工節點審核等，協助船東在預算、品質、性能等考量間取得平衡。

船舶中心亦可協助客戶審查造船契約及建造規範內容，除提供建議外，並協助客戶與其簽約對象進行協商討論，確保船舶中心客戶之權益。此外，船舶中心亦可依個案需求提供業主包括新造船艦艇、船舶改裝維修、船舶歲修或大修工程、動力廠動力系統維修等工程的駐廠監造或重點監工與檢驗服務。

深耕載重　創造傲人實績

船舶設計是造船的靈魂，也是船舶中心存在的價值之一，正因深耕設計領域不遺餘力，船舶中心成立 40 年來，以極大熱忱積極參與航運界、造船界與軍方的船舶運作實務，並藉以累積了設計服務與技術服務的巨大能量。

船舶中心的設計服務提供專案管理，以整合式服務滿足客戶全方位的需求。

The design services of the SOIC can provide the project management services, which can use the integration services to satisfy the various requirements of our customers.

截至民國 105 年（2016）3 月，船舶中心已完成包括散裝貨輪、貨櫃輪、原油輪、油品輪、木材運輸船、水泥專用船、冷凍冷藏船、研究船、拖船、各類艦艇、遊艇、漁船及其他船型等共 84 型船舶新設計，船廠使用船舶中心之設計共建造完成 264 艘船舶，合計載重量為 604 萬噸；而技術服務的成績亦相當可觀，總計提供公民營機構共 470 艘的審圖與監造服務，載重量達 1,288 萬噸！

船舶中心在滿足客戶需求的自我要求下，以彈性靈活的運作方式，達到客戶的需求在哪裡，船舶中心的服務就到那裡，因此在必要時，亦可提供現場施工技術顧問，派遣工程師進駐船廠，協助解決施工期間所面臨的各項疑難問題。服務不分大小，只論專業，從為客戶進行可行性評估，到客戶提出需求，船舶中心就先行投入研究，甚至在保固期過後，船舶中心仍義不容辭為客戶提供周延的售後服務。

每艘船都代表客戶的希望與夢想，一個個夢想就匯聚成產業的能量，這就是國家經濟穩定成長的羽翼，船舶中心任重而道遠，竭盡所能以優質的設計服務，發動產業起飛的引擎。SOIC

the final finished ship building regulations put together to make the contracted design. This is the core of the design services of the SOIC. Ship manufacturers can generate more detailed building designs according to the design diagram.

Project Management - Satisfy Various Requirements

The design service of the SOIC can also further provide project management services, which utilize integration services to satisfy the various requirements of our customers. Those services primarily include: ship bidding operations, regulation examination and discussion, technical services, etc.

Bidding operation services: The SOIC can provide bidding announcements, bidding notices, building contract draft, tendering document examination and other services. The diagram examination service is based on the requirements of ship owners to assist in the examination of various design diagrams, construction diagrams, equipment company drawings and the construction node examinations of the main ship building schedule. This helps ship owners achieve a balance between budget, quality, performance and other considerations.

The SOIC can also help our customers examine ship building contracts and the contents of the building regulations. The SOIC can not only provide suggestions, but it also can help our customers to discuss the above contents with the objective of signing the contracts to protect the rights of the customers of the SOIC. In addition, the SOIC can further provide the on-site building monitoring or major building monitoring and inspection services for the newly built boat, ship modifications & repairs, yearly ship repairs or major repairs, power system repairs and the like according to the requirements of each customer.

Work Harder - Great Success

In the 40 years following the foundation of the SOIC, the SOIC has actively participated in the practical affairs of ship operations in the shipping, ship building field and military fields with great enthusiasm.

As of March 2016, the SOIC has finished 84 new ship designs, including bulk carriers, container carriers, crude oil carriers, oil product carriers, wood carriers, cement carriers, refrigerated/reefer vessels, research ships, tug boats, various other ships, pleasure boats, fishing boats and the like. Ship manufacturers have built 264 vessels by using the SOIC's designs with a total load weight of 6.04 million ton. The performance of the technical services has also been brilliant. The SOIC has provided the drawing examination and building services for 470 ships of the private and public institutions, and the total load weight is up to 1,288 million tons!

厚植世界級設計能量

從商船到公務船的設計大觀

軍事艦艇與非武裝公務船舶的設計是船舶中心近 10 年來的主要業務來源，特別是軍艦部分，「潛艦國造」為我國與國防相關船舶產業的領軍策略之一，而深化技術能量、提升技術經驗，正是船舶中心的重要使命。

船舶中心在軍艦設計方面，不斷交出亮麗成績，足見設計能量的持續提升。從人員運輸艦凌雲艦、萬安艦、雲峰級運輸艦，到油彈補給艦武夷艦、新一代海軍油彈補給艦（磐石艦），以及各式巡防艦，如光華三號錦江級近岸巡防艦、迅海級匿蹤飛彈巡防艦（沱江艦）等。

近 10 年來，船舶中心的主要業務來源為軍事艦艇與非武裝公務船舶的設計。（照片提供：台灣國際造船股份有限公司）

Military vessels and non-armed official ships are the major business sources of the SOIC for the recent decade.

新一代軍艦建設　落實國艦國造

其中採雙船體結構的沱江艦，由海軍委託船舶中心設計，是我國第一艘搭載全分散式工作站設計戰鬥系統的軍艦，定位於攻擊艦艇，因具有快速移動，加上雷達匿蹤的特性，可迅速接近目標發動飛彈攻擊，且由於體型小，吃水淺，利於戰時疏散到中小型漁港，作戰力與存活力都強大。

船舶中心的商船設計素有口碑，包括各種規格噸位的貨櫃輪、散裝貨輪、油輪、冷凍冷藏船、自卸式散裝貨輪、自卸式水泥船等。

The commercial ship design of the SOIC always has a high reputation, including cargo carriers, bulk carriers, fuel tankers, reefer vessels, self-discharge bulk carriers, self-discharge cement vessels with various specifications and tonnage and the like.

新島際東海明珠交通船，由船舶中心規劃，龍德造船廠設計。

New Inter-island East Pearl Traffic boat, planned by the SOIC and designed by LUNG TEH Shipbuilding CO.,LTD.

沱江艦艦艉兩側有可開啟的大型艙門，其一內裝硬式橡皮艇，可擔任海上臨檢、短程交通艇用途；另一側為釋放拖曳式陣列聲納的位置，具長程偵蒐，並對來襲魚雷做出預警的功能。其獨立作戰能力為一大特色，利於提升國軍海防作戰能力。

新一代海軍油彈補給艦磐石艦（AOE-532）係由船舶中心設計，台船高雄廠負責建造，磐石艦可謂是武夷艦進化版，基於匿蹤考量，船體設計略向內傾，外型更為洗鍊。補給裝置為左右舷各有液態油水傳輸裝置及高速自動傳輸梭車，航行時能同時為兩側船艦進行油料與彈藥物質補給，另在艦艉設加油裝置、艦艏甲板與艦舯各有一對起重機，可做裝卸物質之用、艦身並增設一車輛出入口，使磐石艦在油彈補給外還增添運輸功能。

磐石艦是目前中華民國海軍噸位最大的船艦，甲板與機庫各可停放一架 33 噸直升機，執行垂直整補外，艦上還設有野戰醫院和健身房、影音設備等。而沱江艦與磐石艦分別被喻為「航空母艦殺手」及「快速戰鬥支援艦」，可謂是船舶中心創新與前瞻技術的集大成者，更為落實國艦國造邁出了重要的一大步！

Develop World-class Design Energy

Military vessels and non-armed official ships are the major business sources of the Ship and Ocean Industries R&D Center (SOIC) in the last decade. "Domestically Built Naval Vessels" is one of the leading strategies of our country and the relevant national defense ship industries. Enhancing technical energy and increasing technical experience are particularly important missions of the SOIC.

The SOIC designs various military vessels, from the attack transports "Ling-Yun AP", "Wan-An AP" and "Yun-Feng AP" to the combat support ships "Wu-Yi AOE", "Pan-Shi AOE" as well as various frigates, such as Guanghua No. 3 Jin-Jiang class inshore frigate, Xun-Hai class stealth missile frigate (Tuo-Jiang frigate), and the new generation of naval combat support ships (Pan-Shi AOE) and the like.

"Navy Vessel Built Domestically" Starts an Important Step

The Tuo-Jiang frigate utilizes double ship body structure, which the Navy commissioned the SOIC to design, and is the first military vessel with a battle system based on the full-distribution working station in Taiwan. The Tuo-Jiang frigate is designated as a battle vessel, which can move swiftly and has a low radar observability feature.

Therefore, the Tuo-Jiang frigate quickly moves to be close to a target and fire missiles to attack the target; as the Tuo-Jiang frigate is of a small size and low draft, so that it can be distributed over the small/medium fishing harbors to provide a strong battle force and high survival rate.

Both sides of the rear of the Tuo-Jiang frigate have large compartment doors that can be opened, and each can accommodate a hard rubber boat. The rubber boat can be used for a sea spot check and as a short-distance traffic boat. The other side is used to release the towed array sonar, which can provide long-distance detection and data collection functions. It can also provide a warning function for incoming torpedoes.

The new-generation combat support ships "Pan-Shi AOE (AOE-532)" is designed by the SOIC, and the Kaohsiung factory of CSBC is responsible for manufacturing it. The supply devices include the liquid fuel/water transmission device and the high-speed automatic transmission shuttle installed at the port and the starboard, respectively, which supply the fuel and ammunition to the ships on both sides at the same time during navigation. In addition, the rear of the boat is installed with a fuel filler, and each of the deck near the ship head and the midship has a pair of cranes for loading cargo. Vehicle access is added to the ship body, thus the Pan-Shi AOE cannot only provide the fuel and ammunition supply function. It also can provide transportation functions.

Currently, the Pan-Shi AOE is the ship with the highest tonnage in the R.O.C. Navy. Each ship's deck and hangar can accommodate a 33-ton helicopter for vertical replenishment. In addition, the ship further provides the field hospital, sports cabin and audiovisual equipment, etc. The Tuo-Jiang frigate and Pan-Shi AOE are also called "aircraft carrier killers" and "swift battle support vessel," respectively, which is an important step in the implementation of the "Navy Vessel Built Domestically"!

「南海之星二號」為澎湖縣交通船，目前已投入澎湖望安、七美等南海離島間的交通運輸。

The “South Sea Star 2” traffic boat belongs to Penghu County; currently, the boat has been used for the traffic transportation between Wangan, Qimei of Penghu County and other islands of the South China Sea.

公務船設計精準　提供全方位海洋產業發展

發展航運和造船事業，不只奠定了國防基石、也緊繫著國家的經濟命脈。船舶中心在公務船設計展現先進技術能量，打響了國際間的名號，如今可說是全方位各式船舶設計的專家。

公務船設計實績包括了早期保七總隊 100 噸級警用巡邏艇、水警局 100 噸級警用巡邏艇、海巡署自動扶正救難艇、海巡署 5 百噸級巡防艦、關稅總局緝私艇、水試壹號漁業試驗船、3 千 4 百匹馬力拖船、4 千匹馬力拖船、南海之星交通船、海洋研究船等等。

其中「南海之星二號」為澎湖縣交通船，由船舶中心初期規劃，龍德造船廠設計建造，目前已投入澎湖望安、七美等南海離島間的交通運輸。該船為全鋁合金建造的客貨交通船，重 5 百噸，最高航速可達 29 節，巡航 25 節，可載客 284 人，並裝設有穩定翼，可有效減少船舶橫搖，提高乘船的舒適平穩度。

此外，除了對於臺灣海洋產業發展肩負著重大責任，船舶中心更扮演著推進科研調查、尖端學術研究、海洋科技研究、扶植海洋產業發展的角色，在國研院臺灣海洋研究中心正積極進行海洋研究船隊建置的時刻，船舶中心也在船舶設計端善盡責任與義務，為帶動海洋科學研究盡心盡力。

商船設計屢見創新　為客戶大幅提升競爭力

船舶中心的商船設計素有口碑，包括各種規格噸位的貨櫃輪、散裝貨輪、油輪、冷凍冷藏船、自卸式散裝貨輪、自卸式水泥船等，在中船所建造的各式貨櫃輪中，國內第一艘 8,000TEU 大型遠洋貨櫃輪即是由船舶中心擔綱設計，並以精良設計獲英國皇家造船工程學會（RINA）年度船舶獎。船舶中心也透過創新設計能量，為客戶的構想提供最佳解決方案。

設計實績包括了海巡署 100 噸級警用巡邏艇、500 噸級巡防艦、1,000 噸級巡防救難艦、2,000 噸級巡護船、3,000 噸級巡防救難艦及自動扶正救難艇等。

The practical design cases include 100-ton police patrol boats, 500-ton patrol boats, 1,000-ton patrol recue boats, 2,000-ton frigate, 3,000-ton frigate, and the self-righting rescue boats, etc.

如 LUZON STRAIT 626,000 CUFT 冷凍冷藏船原由希臘船東提出構想，由船舶中心落實設計。該船為多層甲板設計，主甲板上置放冷凍貨櫃，貨艙內為冷藏貨物，為節省貨物運輸時間，於舷側門設計為活動棚架，使下雨天也能裝卸貨物，為全球第一個擁有此型態設計的貨輪。

而全球第一艘電力推進自卸式水泥船亦為船舶中心設計作品，動力全由發電機帶動，簡化船上機械，便於保養外，其配置電動馬達驅動 360 度轉向雙螺槳推進器，行動轉向靈活。另外由於吃水淺，可航行於淺水港，進出港靠離碼頭時轉向靈活，不需拖船協助，既方便又可降低營運成本。到港後利用船上卸貨裝備即可將水泥卸到岸上，從靠港時間、卸貨時間、環保要求與收艙時效來考量，其在營運上佔有極大優勢，此作品也是船舶中心以創新創意為客戶提升競爭力的佐證之一。SOIC

Accurate Design of Official Boats

Take the official boats as an example, the practical design cases include the 100-ton police patrol boats of the Seventh Special Police Corps during the early times, the 100-ton police patrol boats of the Marine Police Office, the self-righting rescue boats of the Coast Guard Administration, the 500-ton frigate of the Coast Guard Administration, the revenue cutters of the Customs Administration, the fishery test boat “Fishery Researcher 1”, the 3400-hp towing tugs, the 4000- hp towing tugs, the South Sea Star ferries and ocean research boats, etc.

More specifically, the “South Sea Star 2” ferry which was planned by SOIC and designed and built by Lung Teh Shipbuilding Co., belongs to Penghu County. Currently, the boat has been used for the traffic transportation between Wangan, Qimei of Penghu County, and other islands of the South China Sea. The boat is a passenger/cargo ferry completely made of aluminum alloy, and weighs 500 tons. Her speed can go up to 29 knots and the cruising speed up to 25 knots. The boat can accommodate 284 passengers and can be installed with stablizers to effectively reduce the rolling of the boat, thus increasing its comfort and stability.

Design of Commercial Boats Keeps Being Innovated

The commercial ship design of the SOIC is very famous, and includes cargo carriers, bulk carriers, fuel tankers, reefer vessels, self-discharge bulk carriers, self-discharge cement vessels with various specifications and tonnage and the like. Among the various cargo carriers manufactured by the CSBC, the first large 8000TEU far sea cargo carriers in Taiwan were designed by the SOIC, and this delicate design obtained the certification of the Registro Italiano Navale (RINA). The SOIC also provides the best solutions according to the ideas of our customers via the innovative design energy. The idea for LUZON STRAIT626,000 CUFT reefer vessels was originally provided by a Greek ship owner, but the design was implemented by the SOIC.

The carrier has a multi-deck design. The refrigerated containers are deposited on the main deck and the cold cargoes are deposited inside the cargo holds. In order to save the cargo transportation time, the side cargo port is designed to have an active scaffold which can be used for loading or unload cargo on a rainy day. The ship is the first carrier with this design in the world.

The first electrical promotion self-discharge cement boat in the world was also designed by the SOIC. All power is provided by the generator to simplify the machines of the boat and for more convenient maintenance. The electrical motors installed in the boat can drive the 360-degree double-propeller propulsor, which is flexible in moving and turning. In addition, as the draft of the boat is low, the boat can be driven in a shallow water harbor, and can flexibly turn when leaving/entering the harbor and wharf without a towing vessel, which provides convenience and reduces business costs. After the boat reaches the harbor, its unloading equipment function can be used to unload cement onto land. Therefore, when taking harbor-reaching time, cargo unloading time, environmental protection requirements and stripping time into consideration, the boat has great business advantages.

海洋研究發展 卓越利器

結合科學儀器　全方位整合設計

為了應付海上科學調查任務，研究船需要具有強大的儀器裝載能力，性能上還須具備足夠動力、良好操控、耐海和靜音性能，整體如何搭配得宜，是船型設計上最大挑戰。

研究船屬於特殊領域，數量稀少，礙於經濟規模考量，船舶中心依照船東需求，設繪相關圖說，之後建造標經公開招標程序，由國內民間造船廠取得標案後，船東將設計圖說交給造船廠進行細部設計與建造。

船舶中心自民國 79 年（1990）起涉足研究船設計監造領域，承接過國家實驗研究院「海研二號」、「海研三號」、「海研五號」等海洋調查研究船，以及行政院農業委員會水產試驗所「水試一號」、「水試二號」等漁業資源研究船。

船舶中心承接過國家實驗研究院「海研五號」的海洋調查研究船。

The SOIC has undertaken the manufacturing projects of the ocean investigation research ships “Ocean Researcher No. 5” from the National Applied Research Laboratories.

客製化設計　提升研究效益

有別於商船或油輪單純載運需求，研究船需裝配科學儀器，執行海上、海底相關研究工作，如透過聲納儀器檢測海底地形、地層結構、洋流等；礙於載台的限制，研究船設計需在空間與研究效益之間取得平衡，從船舶重心分配與結構安全，到工作甲板、實驗室空間（儀器、實驗室、採樣庫存）與動線配置、船舶作業海域海象、停泊碼頭條件等都要一併考量。

研究船需裝配科學儀器，因此需在空間與研究效益之間須取得平衡。

Research ships should be designed to achieve a balance between the space and the research performance because they should be installed with scientific instruments.

研究船現今幾乎都採「客製化」設計，例如規劃佈置，需考量該船預定執行之海上科學調查任務需求及其作業所需之裝載設備，設計甲板作業空間、工作吊車及門型吊架佈置時，須具彈性調配能力，以提升空間使用效率。此外，研究船在儀器安裝上也有諸多專業考量，例如安裝在船底聲納系統易受氣泡干擾，聲納音鼓佈置須依廠家建議，避免船舶行進時水流將水面汽泡帶至船底並遠離較大噪音源機器裝備之安裝位置，以提升聲納量測品質及準確性，進而提升水下聲學量測之效率。又如採用動態定位系統，使研究船能進行精確定點控制或航向維持，可大幅提升量測效率、品質及準確性。

低噪靜音　未來發展趨勢

因應研究船「水下噪音建議值」新規範要求，船舶中心已在研究船設計上強化水下噪音靜音工程，並經實船驗證可符合此一規範。

為符合此一水下設計要求，需將水下噪音控制作為最優先考量因素，並在設計上進行水下噪音管制，制定各主要水下噪音源之振動噪音上限，以確保設計可符合水下噪音要求。設計改良包括船體線型設計與螺槳設計，能有效降低螺槳入流紊流分布、避免螺槳空蝕、降低螺槳振動；船艙佈置採用船體雙殼的設計；推進系統配置採用電力推進系統，搭配發電機採用雙層避震座，降低主要機械裝置引起之結構振動與空氣噪音的產生及散佈傳遞，達到噪音抑制的目的。

噪音抑制是未來造船的新趨勢，上述研究船的設計改良之經驗，為水下艦艇開發奠定良好基礎。SOIC

Excellent Ocean Research Tool

The Ship and Ocean Industries R&D Center (SOIC) has entered the field of designing ships and monitoring shipbuilding from 1990, and has undertaken manufacturing projects of the ocean investigation research ships from the National Applied Research Laboratories, including the “Ocean Researcher No. 2”, “Ocean Researcher No. 3” and “Ocean Researcher No. 5” and the fishery resource research ships, including the “Fishery Research No.1” and “Fishery Research No.2” from the Fisheries Research Institute, COA.

Customized Design – Better Research Performance

Different from the single transportation requirement of commercial ships or passenger liners, the research ships should be installed with scientific instruments for executing the research tasks over and under the ocean. This includes the detection of the landforms of the sea floor, stratum structure, ocean current and the like. As limited by the type of carrier, the research ship should be designed to achieve a balance between the space and the research performance. All conditions should be taken into consideration, from the center of gravity and structural safety of the ship to the working deck, laboratory space (instrument, laboratory, sample storage), path arrangement, sea status at the ship operation ocean area, wharf conditions and the like.

Currently, almost all the research ships utilize customized designs. For example, arrangement planning should take the requirements of the pre-determined ocean scientific investigation tasks of the ship and the necessary equipment for the tasks into consideration. When designing the deck operating space, and the arrangements of the working crane and the gantry crane, the flexible adjustment ability is necessary to increase space utilization efficiency.

In addition, there are many professional considerations about the installation of the instruments. For example, the sonar system installed at the bottom of the ship tends to be influenced by air bubbles, and the arrangement of the electro-acoustic transducer of the sonar system should observe the suggestions of the equipment provider to be away from the installation position of the machine with a higher noise to better the measurement quality and accuracy of the sonar system and further increase the efficiency of the underwater acoustic measurements. For instance, the dynamic positioning system can be used to enable the research ship to perform accurate set-point control or keep a constant navigation direction, which can significantly better the measurement for efficiency, quality and accuracy.

Low Noise and Quiet – Future Development Trends

In response to the requirements of the new regulations “underwater noise suggestion value” of the research ship, the SOIC has utilized underwater noise reduction techniques in the design of the research ships. The design improvement can be implemented in the ship streamline body design and the propeller design in order to effectively reduce the turbulent flow distribution of the propeller, reduce the cavitation erosion and the vibration of the propeller. The propulsion system uses an electrical power propulsion system, and the power generator uses a two-layer vibration absorption base, which can reduce the structure vibration of the major mechanical devices, and the generation and spreading of the air noise to achieve the object of noise reduction.

Noise reduction is the latest trend in shipbuilding, and in the future, the design improvement experiences of the research ship will be very helpful towards the development of underwater vehicles.

水上休閒遊憩風行世代

綠能動力＋安全備援品質全面提升

乘船遊湖徜徉山水，何等快意自在！為降低柴油引擎污染，並符合綠能動力趨勢，船舶中心投入多項電動船舶之技術開發，包括為綠能客船開發雙體船型，降低船體阻力，以減少電池電力消耗。由於採用馬達推進，相較於柴油引擎，振動噪音降低極多，使水上觀光遊憩品質以及臺灣綠能船舶產業之技術能量，全面提升。

環保領航　電動船舶實力盡現

為配合政府節能減碳政策，船舶中心自民國 92 年（2003）開始投入電動船研發，並與澳洲技術合作開發雙體電動船，民國 93 年（2004）陸續完成宜蘭縣政府 2 艘冬山河水上巴士及 30 艘電動小船之規劃設計，民國 94 年（2005）協助設計台南虎頭埤之單體電動船。船舶中心所研發的電動船舶，運用了多項科專成果，包括船型計算流力分析技術、雙胴體船型設計技術、造型及內裝佈置設計技術、穩度分析技術等，協助業者開發符合市場需求、適合內陸水域發展的環保型綠色能源遊艇。

民國 99 年（2010）起，船舶中心開始投入新一代的太陽能電動船開發，陸續完成多艘電動船隻，如高雄太陽能愛之船，即為展現無油煙、無污染、無噪音的新世代電動船，目前愛河共有 12 艘提供服務，是亞洲最大的太陽能電動船船隊。

此外，為配合政府推動「綠色低碳湖」觀光，船舶中心也為南投日月潭、石門水庫、翡翠水庫及曾文水庫，開發太陽能電動客船、混合動力電動船、燃料電池電動船。

船舶中心為綠能客船開發雙體船以減少動力消耗，使水上觀光遊憩品質以及臺灣綠能船舶產業競爭力全面提升。

The SOIC developed the double-body ship to decrease the power consumption to completely enhance the water tourism leisure quality and the industrial competitiveness of the green ship industry of Taiwan.

船舶中心於民國 102 年協助高雄愛河新建綠能電動船艇，成為亞洲第一個正式營運的太陽能電動觀光船隊。

In 2013, the SOIC assisted with the building of green powered electrical yachts for the Love River in Kaohsiung, which were later transformed into the first solar powered electrical sightseeing fleet that formally went into operation in Asia.

船舶中心輔導業者開發環保型綠色能源遊艇，該船型不僅符合市場需求、亦適合內陸水域發展。

The SOIC assists manufacturers to develop environmentally friendly green-energy pleasure boats suitable for inland waters.

以旅遊勝地日月潭為例，配合載客船舶全面電動化政策，在船舶中心的推動及協助下，陸續開發直流快速充電系統與全電力雙體電動船，最高航行速度可達 10 節、電池電力可供航行 6 節 8 小時，足夠全日營運需求，有效提升水域遊憩與觀光品質。

除了電動船之外，在私人遊艇部分，船舶中心也開發外銷型複合動力遊艇，輔導南海遊艇及隆宜遊艇等業者，拓展綠能遊艇之國際市場。

WATER 911　強化水上救援能量

水上休閒活動的發展，需要有安全快速的救難載具作為配套措施。在經濟部技術處及工業局的支持協助下，船舶中心成功研發「WATER 911」（水上快速救援摩托艇），水上摩托車具備快速移動與輕巧靈活之特性，應用於緊急水上救援時能提供高機動性，亦具備快速充氣橡皮墊以擴大救援空間，增加救援能量與救援存活率。

WATER 911 抵達災害現場後，只須轉動高壓鋼瓶充氣鈕，高壓氣體在 12 秒內立即將艇身兩側氣囊充氣完成，迅速變為動力橡膠船，一艘 WATER 911 能承載 4 名落水人員，快速返回岸邊、港口或大型救難船，完成救援任務。除了安全救難功能之外，WATER 911 以其快速、靈敏及穩定的特性，亦能應用作為水上遊樂載具，提供全家水上遊樂或水上日光浴使用。SOIC

發生海上溺水事件時，一套快速、安全的救援系統是救援成功的關鍵。在經濟部技術處、工業局的支持下，船舶中心成功研發「Water 911」水上摩托車救援模組化套件。

With the support from Department of Industrial Technology and Industrial Development Bureau, the SOIC successfully develops the rescue modulation kit of "Water 911" water scooter.

Age of Water Leisure

Taking a sightseeing trip on a boat is so much fun! In order to decrease the pollution from diesel engines and meet the green energy trend, the Ship and Ocean Industries R&D Center (SOIC) has developed various electric ship technologies. In addition, the SOIC has also further developed the double-body ship to decrease power consumption to enhance the water tourism leisure quality and the industrial competitiveness of the green ship industry in Taiwan.

Focus On Environmental Protection – Show the Power of Electric Ships

In recent years, in order to conform to the green energy and carbon reduction policies, the SOIC started the R&D of electric ships in 2004. The center uses the results of various technology development programs, including the ship shape calculation fluid mechanics analysis technique, double ship body design technique, inner decoration design technique, stability analysis technique and the like to assist the manufacturers to develop the environmentally friendly green-energy pleasure boats suitable for inland waters.

Since 2004, the SOIC has assisted in the design of the single body electric boat of in Hutoubi, Tainan. Afterwards, the SOIC cooperated with Australia to develop double-body electric boats, and then established the fleet with 30 ships in the Dong Shan River of Yilan and the waterbus chartering night travel project in 2007. From 2010, the solar-energy "The Love Boat" was built one after another, which has no smoke, no pollution and no noise. Currently, there are 12 such boats in service, which is also the largest solar-powered ship fleet in Asia.

In order to promote "Green low-carbon lake" tourism, the SOIC also gradually developed the DC quick-charge passenger vessels, hybrid-power electric passenger vessels, fuel-battery electric passenger vessels and fully electric double-body electric passenger vessels for the Sun Moon Lake, Zengwun Reservoir and Shihmen Reservoir in Nantou.

Take the scenic spot "Sun Moon Lake" as an example. For the purpose of conforming to the passenger vessel complete-electrification policy, the DC quick-charge boats and the quick-charge station have been developed one by one by means of the assistance and the promotion of the SOIC. On the other hand, the speed of the first commercially operated full-electricity double-body electric passenger vessel in Taiwan can reach 10 knots, and the battery can provide the power for 8 hours when the ship is travelling at 6 knots. Therefore, the ship does need to be charged during the day, which can effectively better the water leisure and tourism quality.

In addition to the electric passenger vessels, the SOIC also developed the export-oriented hybrid-power pleasure boats to assist Bluewater Yacht Builders Ltd and LUNG-YE Enterprise Co. Ltd to expand its international market.

WATER 911 Enhances Water Rescue Energy

The development of the water leisure activities needs the safety rescue carriers as the backup. Via the assistance from DOIT and IDB of Ministry of Economic Affairs, the SOIC successfully developed the "WATER 911" (Water high-speed rescue motor boat). Through its high speed, light weight and flexibility, and the space flexibility of the quick-inflating rubber mat, rescue boats can be swifter and more mobile.

After the WATER 911 reaches the disaster spot, the only thing needed to be done is to rotate the inflation button. Then, the high-pressure gas in the high-pressure steel cylinder will immediately inflate the air sacs on both sides of the boat. Afterwards, the boat will immediately be changed to a power driven rubber boat in 20 seconds. One WATER 911 boat can carry six rescue victims and swiftly return to the coast, the harbor or the large rescue boat to finish the rescue mission. In addition to the rescue function, the WATER 911 can also serve as a recreation carrier with its features of swiftness, flexibility and stability.

誠信 Integrity

在造船產業中，需求者和製造者需要充分良善的溝通，才能催生出一艘實用、性能優異、又符合海上實際需求的船舶。

船舶中心補足了中間的重要角色，從規劃、簽約、設計、審圖到製造，一條龍式的專業服務，深受船東與船廠的信賴，揚名東亞地區。

在強大的協調與產業整合能力之下，船舶中心讓臺灣在各式船型的製造領域上，屢屢成為焦點。

In the shipbuilding industry, sufficient and friendly communications must be facilitated between the client and the manufacturer to build a vessel that is practical, of excellent performance and able to meet actual marine demands.

The SOIC was established to take on the intermediate role between the client and the manufacturer. From planning, contracting, designing, reviewing to manufacturing, the SOIC provides a complete professional service which is widely recognized and trusted by ship owners and shipyards alike, further building a great business reputation in Southeast Asia.

With its excellent coordination and industrial integration capability, the SOIC has become a great player in various shipbuilding domains in Taiwan.

優質技術服務
穿針引線的關鍵者

無縫整合資源　船舶建造順利

船艦在茫茫大海中，不畏風浪地向著目的地奔馳，這樣的場面令人震撼。然而，一艘艘船艦從單純的船體構造，到能夠航行海上順利執行任務，其背後隱含著許多心血，船舶中心就在無數船艦的設計與製造過程中，貢獻自身的技術服務，擔任著幕後重要推手。

船舶中心多年來完成各種船舶的技術服務，包含油輪、散裝貨輪、貨櫃輪、水泥船、電力推進船舶、交通船、各種公務船、工作船、艦艇或軍事用艦艇等。

For these years, no matter whether or not they are oil carriers, bulk carriers, container carriers, cement boats, electric propulsion boats, traffic boats, various official affairs boats, working boats, vessels or military vessels and the like, the SOIC can provide proper technical services.

技術服務是船舶中心的主要核心業務之一，一艘船舶能否在符合各項規範，以及設計安全無虞的情況下，依船東的需求在期限內順利建造完成，端賴船舶中心在船東與船廠之間，靈活地協調溝通，適時提供專業技術與建議，扮演穿針引線的關鍵角色。

船舶中心所有技術服務人員都是專職工作者，長期累積了建造船舶的專案經驗。
All technical service personnel of the SOIC are full-time workers, and they have accumulated the experiences of the shipbuilding projects for a long time.

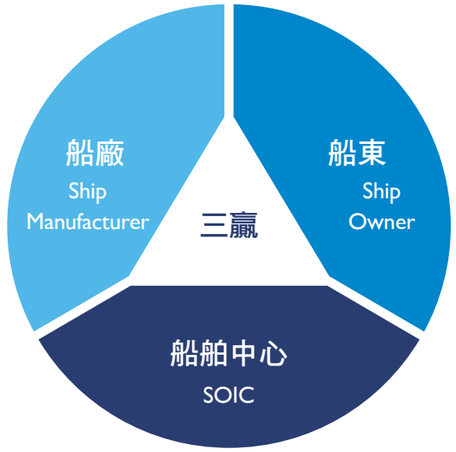
各式船舶服務游刃有餘

船舶中心於民國 65 年（1976）設立，當時成立目的是要讓臺灣建立自行設計船舶的能力，因此初期任務是以船舶設計為主，後來為了配合客戶端的需要，逐漸累積了技術服務的能力。

民國 68 年（1979）左右，因中油造船需要監工人員，委託船舶中心協助，從此開啟中心提供技術服務的契機，隨著名聲打響，國內外的船東與造船廠，紛紛與船舶中心接洽，要求為旗下委託建造的船舶提供同樣服務，也使之逐漸成就船舶中心主要服務項目之一。

多年來，無論是油輪、散裝貨輪、貨櫃輪、水泥船、電力推進船舶、交通船、各種公務船、工作船、艦艇或軍事用艦艇等各種船舶的技術服務，船舶中心皆能勝任，成為該領域的佼佼者；而當年負責技術服務的工程處，隨著民國 101 年（2012）船舶中心更名轉型，亦改由船舶產業處與產業服務處兩個新成立單位負責。

船舶建造是一個龐大的整合性系統工程，舉凡「規劃——簽約——設計——審圖——建造」的 5 大階段，船舶中心的技術服務都從中扮演著不可或缺的關鍵功能，而這段讓船舶從無到有的歷程，均有賴「船東、船廠與船舶中心」的鐵三角協力合作，始能水到渠成。



Excellent Technical Service - Key Negotiation Service Provider

Competent to Provide Various Boat Services

The Ship and Ocean Industries R&D Center (SOIC) was founded in 1976, and the object of the foundation of the SOIC was to enable Taiwan to have the boat design ability. Anout 1979, as it was in need of supervisors, the China Shipbuilding Corporation asked the SOIC to provide assistance, which created a chance for the SOIC to start providing technical services.

For these years, the SOIC has always been competent in providing proper technical services for various ships, such as oil carriers, bulk carriers, container carriers, cement boats, electric propulsion boats, traffic boats, various official boats, working boats, vessels and military vessels, etc.

Shipbuilding is a large systematic integrative form of construction. The technical services of the SOIC have always played an important role in all of the five major stages: "Planning – Contracting – Design – Design inspection – Manufacturing." The whole process of manufacturing a ship should depend on the cooperation of the three parties, the ship owner, ship manufacturer and the SOIC."

Bridge for Connecting Ship Owners and Ship Manufacturers

In most cases of the initial "planning stage," ship owners have the ship manufacturing demands first and then the ship manufacturers are commissioned to plan the manufacture of the ships. However, these ship owners are not familiar with the ship design and manufacturing operations, so they ask for assistance from the SOIC. In rare cases, the ship manufacturers have the plans first and the plans are contrasted with the requirements of the ship owners. Then, the plan directions are confirmed after a discussion. Most requirements proposed by the ship owner involve market profit, but these requirements may be different from the technical specialties of the ship manufacturer. Therefore, the SOIC, the bridge of both parties, should thoroughly negotiate with the ship owner in advance during the order stage in order to confirm the requirements of the ship owner. Then, the SOIC negotiates with the ship manufacturer according to the requirements. Afterwards, the SOIC transfers the practical requirements into the achievable engineering object to make sure the ship manufacturer can completely understand these requirements and then successfully finish the planning.

After the planning is confirmed, the next stage is the "contracting" stage. The SOIC further assists the ship owner to discuss the ship's specifications with the ship manufacturer, such as the necessary functions of the ship, desired length, capacities, sizes and load weights and other detailed conditions inside/outside the ship, proper materials for manufacturing the ship and the like. It is necessary to transfer these regulations into proper terms and then record them in the specification documents to prevent misunderstandings from occurring in the future. Then, the SOIC prepares a formal specification document,

讓船舶從無到有的歷程，均有賴船東、船廠與船舶中心的協力合作。
The process making a ship from nothing to success depends on the cooperation of the three parties – the ship owner, ship manufacturer and the SOIC.

串聯船東與船廠的中介橋梁

在一開始的「規劃」階段，大部分是船東有建造船艦的需求，要委託造船廠規劃，但本身並不熟悉船舶的設計與製程作業，遂向船舶中心尋求專業協助；也有少數情況是造船廠先有規劃，再與船東的需求對照，經討論後確定方向。

由於船東所提出的需求多半與市場營利相關，與造船廠本身擅長的工程與技術層面存有差距，因此處於中介地位的船舶中心，在此一階段主要任務是先與船東深度溝通，明確知道船東建造船艦的需求，再根據其需要與造船廠展開協商，將船東的實質需求解釋成工程上能夠達成的目標，讓造船廠充分理解，使其順利完成規劃。

確定規劃後，即進入「簽約」階段，協助船東與造船廠進一步地討論造船規格，例如：船舶要具備哪些性能？船體內外細部需要的長度、容量、大小與載重量，以及建造材料……等，而在設計過程中，有哪些造船規範需要遵守？如何將林林總總不一的規範，轉化成適當的詞彙記載於規範書上，使得日後執行時不致產生誤解，這些細節，船舶中心都必須考量雙方的需求與利益，盡力協調落差，達成共識。經過若干次修正彙整、確認完成後，再編製為正式規範書，另一方面協助船東向造船廠詢價、估價，談妥價格後，兩造始正式簽訂財物採購契約。

接下來的「設計」階段，是由造船廠根據前述談妥的合約內容進行船艦設計，完成設計圖後，船舶中心即要協助船東「審圖」，舉凡關於設計圖說、施工圖說、裝備廠家圖說及主要造船時程之施工節點等作業都在審查之列，尤其遇到合約文字不易解釋清楚的設計時，就要利用設計圖加以輔助表達。另外，像是設計圖的內容要與造船規範一致、須符合船舶法規以及造船慣例等，都要逐一確認，後續船舶建造工作才能夠有所依循。

監造確保船舶安全與可靠

進入最後的「建造」階段，船舶中心產業服務處會委派駐廠經理帶領一個工作團隊，長期駐在造船廠，期間將依據合約內容、既定的預算與時間等，在建造過程中進行檢查，監督造船廠的施工進度與品質，對於涉及營運和船舶經濟性、操作和維修等，進行各種檢驗與追蹤，例如海上測試、振動噪音測試等，當發現不合標準，就要向船廠要求改進，研擬出解決之道，以有效保證船舶建造的安全性與使用的可靠性，直至船舶完工、交船，並且協助驗收，後續的保固維修服務也不可少。

船舶中心雖協助船東而派員駐廠監工，但立場上並不是與造船廠對立，彼此是共同夥伴關係，大家一致目標都是依循合約把船舶建造完成，圓滿完成船東託付的任務。此外，在進駐廠內到正式交船的這段期間，駐廠經理除了要與造船廠勤加溝通、協調，使監造品質維持在最佳狀態，也需與船東保持密切聯繫，依契約內容定期交予進度報告，亦需提供工作報告給船舶中心，讓船舶中心掌握船舶建造的所有情況，務求工程能夠如期、如質、如預算目標完成。

駐廠經理是攸關監造工程能否順利運作的關鍵人物，為此，船舶中心在指派人選時特別慎重，除了專業技術與溝通協調能力外，有時也會參考船東與造船廠意見，選擇與他們合作起來有默契的人選；另也會以輪調方式指派，避免同一人在同一船廠服務過久，缺乏成長動力，凡此種種考量，都是希望所提供的技術服務能夠準確到位。

在「建造」階段，船舶中心產業服務處會委派駐廠經理帶領一個工作團隊，長期駐在造船廠，監督造船廠的施工進度與品質。
During the "manufacturing" stage, The industry service department of the SOIC assigns an on-site manager to lead a work team who will reside in the shipyard during a long period to supervise the shipbuilding schedule and quality of the ship manufacture.

and then helps the ship owner acquire the quotation, price estimates and the final price from the ship manufacturer. Afterwards, the two parties can formally sign the financial procurement contract.

The following stage is the "design" stage. The ship manufacturer designs the ship according to the previously settled contract in the previous stage; then, the SOIC helps the ship owner "examine the drawing." All design drawings, construction drawings, equipment manufacturer drawings, construction nodes of the major shipbuilding schedule and other relevant operations should be listed as the examination items. In particular, if a design cannot be clearly explained by the text of the contract, the design should be further presented by a design drawing.

Ensures the Safety and Reliability of the Shipbuilding by Means of the Overseer

The final stage is the "manufacturing" stage. In this stage, the Industry Service Department of the SOIC assigns an on-site manager to lead a work team for residing to reside in the shipyard for a long period. During this e period, the SOIC inspects and supervises the manufacturing schedule and quality of the ship manufacturer according to the contract, pre-determined budget, time, etc. In addition, the SOIC inspects and tracks all items related to the economy, manipulation, repair of the ship and the operation, such as the ocean test, vibration test and noise test, etc. If any one of the above items fails to conform to the standards, the SOIC asks the ship manufacturer to improve the item and provide a solution in order to ensure the safety and reliability of the ship. Furthermore, the SOIC also provides the after-sales service after the ship is finished, delivered, and accepted.

The SOIC provides overseers that stay at the factory for the purpose of assisting the ship owner. Therefore, the SOIC and the ship owner are partners. During the period from the on-site manager residing in the factory to the acceptance of the ship, the on-site manger should not only frequently communicate and negotiate with the ship manufacturer to optimize the shipbuilding and supervising qualities, but also should frequently contact the ship owner. In addition, the on-site manager should provide a schedule periodic report to the ship owner according to the content of the contract. Furthermore, the on-site manger should also provide the working report for the SOIC to control the whole manufacturing process. In this way, the shipbuilding can be finished according to the predetermined schedule, quality, and budget.

The on-site manager is the key man to determine whether the shipbuilding process runs smoothly. Accordingly, the SOIC carefully selects its on-site manager. In addition to the professional technique and negotiation ability, the SOIC further takes the opinions of the ship owner and the ship manufacturer into consideration to select a proper on-site manager capable of cooperating with them. Besides, the SOIC will also replace the on-site manager by job rotation to avoid the on-site manager runs out of enthusiasm due to job burnout.

Since 2001, many domestic and foreign ship owners have started to ask the SOIC to provide supervising services in domestic and foreign ship factories, including China, Vietnam, Japan, Korea and Indonesia.

培育整合性人才不遺餘力

船舶中心提供技術服務已有 30 多年的歷史，從一開始無心插柳配合客戶需求而發展，到後來因好口碑傳開，民國 90 年代起就有國內外船東委託至國內外造船廠進行監造工作，包括中國大陸、越南、日本、韓國、印尼等，除了負責任的態度與良好服務品質深獲客戶信賴外，追根究柢，所依靠的是船舶中心扎實的人才培育與豐富資料庫的建置，以及對技術服務的高品質要求。

船舶建造是屬於團隊合作的工作，需要橫跨船東、造船廠與外部廠商等不同組織，集各界之力才能完成，因此資源調度與整合能力格外重要。相較市場上部分接到任務才臨時組成的團隊，船舶中心所有技術服務人員都是專職工作者，長期累積了建造船舶的專案經驗，無論是前期的設計審圖，還是後期的現場監工，都具有充分且豐富的實戰力，加上船舶中心常安排各項研習課程，讓員工隨時吸收船舶市場的最新趨勢，建立正確觀念。

不僅如此，進駐各船廠監工的工作人員也會彼此交流。不同國家或地區船廠監工的團隊，也透過手機應用程式，時而分享監工的實際狀況、遇到難題要怎麼處理，互相給予提醒與建議。部分專案團隊技術服務結束返國後，船舶中心也會舉辦心得交流會，讓工作人員分享駐廠經驗，藉此讓同仁瞭解不同國家造船廠的實務工作狀況，以作為日後的參考。

船舶建造專案的每張設計圖與工作報告書，都詳細記載著當時船舶工程的建造軌跡，以及各種突發狀況與解決應變事宜，船舶中心都將這些寶貴資源仔細地加以收藏庫存，在檔案數位化之後，更掃描成電子檔，方便工作人員瀏覽，讓經驗累積得以傳承。另外，船舶中心除了自有一套內部檢驗標準，亦通過 ISO 9001，以及全球最具權威性的認證機構之一 ——挪威驗船協會（DNV）的認證，用意就是要精進技術服務品質，將自身的專業發揮到淋漓盡致。

技術服務的使命，在於運用船舶中心多年累積的專業，將客戶（船東）的需求與期望，轉化為可落實的技術層面，透過與造船廠等單位的協力合作，讓船舶最終能夠如願執行任務。達成船東的期望只是基本要求，每艘船舶建造完成，無論是執行商務或公務，能夠貢獻所長、造福社會，技術服務的付出就有了價值，這也是船舶中心最深層的信念。SOIC

船舶中心在建造過程中進行檢查，監督造船廠的施工進度與品質，對於涉及營運和船舶經濟性、操作和維修等，進行各種檢驗與追蹤。

The SOIC inspects and tracks all items related to the economy, manipulation, repair of the ship and the operating business.

Compared with the temporary teams established right after the undertaking of projects, all technical service personnel of the SOIC are full-time workers. In addition, the SOIC often conducts various workshops and experience sharing meetings for all personnel to share their factory residing experiences to allow the personnel of the SOIC to understand the practical working situations of the shipyards of different countries as a future reference.

The SOIC carefully stores all precious resources. After the files are digitalized, the SOIC further scans these files as electronic files for our staff to conveniently browse at a later time. In this way, our staff can successfully inherit our accumulated experiences. In addition, the SOIC not only has their own internal inspection standards, but also passes ISO 9001 and the assurance of Det Norske Veritas (DNV), one of the most authoritative assurance institutes in the world.

船舶建造是一個龐大的整合性系統工程。

The shipbuilding is a large systematic integration construction process.

認真積極且高效
不負客戶所託

技術服務跨國案例實證

每一艘船舶建造規模與任務不同，船舶中心每回所提供的技術服務也都是獨一無二，在達成船東需求為前提下，面對各種挑戰都需逐一化解，多年來精準與認真地提供技術服務，將每個案例都做到最完美。

香港寶金企業委託的案例是船舶中心相當成功的實績之一。

The task outsourced by Hong Kong Bao-Island Enterprise Ltd. is an extremely successful case attained by Ship and Ocean Industries R&D Center (SOIC).

船舶中心提供技術服務以來，協助國內外船艦完成建造不只上百艘，無論是公務或商用船，每項任務目的不同，監造時要處理林林總總的事項、面臨突發狀況，需要專業、溝通與耐心，也考驗著監造人員的應變能力。

跨國案例的船東還有中鋼運通，船舶中心多次為其監造船舶，合作相當愉快。

The transnational ship owner also includes China Steel Express. The SOIC has supervised and built a total of 4 vessels for the China Steel Express, indicating a smooth and pleasant collaboration between the two parties.

身兼監工建造與指導船廠之責

船舶監造經常是跨區、跨國的技術合作，船東為國內外企業委任，船舶中心常要派員前往各地造船廠監工，也因此船舶中心的監工人員必須克服在不同工作環境與條件下，與各國籍與地域人士合作，在期限內順利完成任務。

船舶中心有 2 次跨國案例令人印象深刻。其中一次船東為香港寶金企業，委託船舶中心提供 18 萬載重噸散裝貨輪監造技術服務，船舶建造則委由一家轉型的造船廠——中國大陸山東青島的北海船舶重工。當船舶中心監工團隊接到這個委託案，發現該造船廠在為另一位船東建造散裝貨輪時，使用的是灌鑄樹脂的新型軸承支撐方式，但操作不夠成熟，導致因摩擦產生溫度過高，連柴油機都燒壞，反覆嘗試修改仍不成功，以致延遲交船。

有此前車之鑑，由船東出面向造船廠反應，建議改回傳統的搪孔作業，獲得船廠的同意，但轉型後的造船廠，新進工人沒有使用搪孔作業的經驗，對此相關知識與技術也不足，在合約都已簽定的狀況下，船舶中心面臨艱巨挑戰。

最後，船舶中心的監工團隊透過溝通、協商、講習等方式，最後終於順利完成試俥驗證。雖然合約並未註明提供額外教學，但技術服務的目的，就是要滿足船東的需要，遇到特殊的作業困境，船舶中心也就義不容辭。終在邊做、邊指導、邊監工的情形下，期限內順利交船，三方皆大歡喜。

Serious, Active, Highly Efficient Never Fail Customers

After the Ship and Ocean Industries R&D Center (the SOIC) started to offer technical services, the SOIC has assisted in the building of more than 100 foreign and domestic ships. These vessels were built for a variety of different maritime purposes, and in both the public and commercial domains.

Supervision & Shipbuilding: Undertaking Shipyard Instruction

Technical cooperation is usually across regions or between countries; and for this reason, the supervising staff of the SOIC are required to overcome different working environments and conditions to cooperate with people of different nationalities coming from different areas in order to complete tasks before their designated deadlines.

In one of the projects, the ship owner was the Hong Kong Bao-Island Enterprise Ltd. who commissioned the SOIC to provide shipbuilding and supervising technical services to the 18-ton (maximum load) bulk carrier. On the other hand, the Qingdao Beihai Shipbuilding Heavy Industry Co., Ltd, a transformed shipbuilding company, was then commissioned to undertake the shipbuilding. When the shipbuilding company built a bulk carrier for a Taiwanese ship owner, the company adopted a new bearing support method using resin; however, as the operation was not adequately conceived and executed, the high temperature caused by friction made the diesel engine fail.

It was suggested to return to using the conventional boring method, which was more reliable; however, the shipbuilding company had just undergone a large transformation, so the new workers not only had no experience in boring operations, but also had insufficient related knowledge and skills.

Finally, the supervising team of the SOIC finally finished the trial verification via communication, negotiation and lectures, etc. Although the contract did not include additional teaching service, the object of the technical service was to satisfy the requirements of the ship owner; thus, the SOIC still tried to do its best to solve the special operating difficulties.

Transnational Collaboration: Overcoming Language Barriers

One of the international projects involved the building of a new bulk carrier with a 209,000-ton maximum load in 2010. The ship owner was China Steel Express, and the SOIC was commissioned to provide technical services during the planning and designing stage. The ship building company was the JMU Ariake Shipyard in Kyushu, Japan. However, the number of our workers working in Japan was not sufficient and the weather during the winter season in

船舶中心提供技術服務以來，協助國內外船艦完成建造不只上百艘，無論是公務或商用船，每項任務目的不同。

After the SOIC has started to provide the technical services, it has assisted the shipbuilding for more than 100 foreign and domestic ships, in addition to public affair ships or commercial ships; the objects of all tasks are also different from one another.

克服語言差異以利跨國合作

另一次跨國案例為民國 99 年（2010）製造新型的 20 萬 9 千載重噸散裝貨輪，船東是中鋼運通，規劃設計階段委託船舶中心提供技術服務，造船廠為日本九州的有明造船所，是全球數一數二的超大型原油輪（VLCC）建造廠。但在跨國人員調配相對精簡的情形下，要在時程內完成任務，著實是一番考驗，且九州的冬天氣候十分乾冷，工作人員需適應氣候，再加上船廠面積大，監造時還得多處來回奔走，若非具備充足的體力，恐無法負荷。

最主要的挑戰來自於語言溝通，船舶中心團隊起初與日方用英文對話，但雙方花費好一番功夫解釋與確認，工作環節常因此卡住，還好派去的工作人員有一點日文底子，索性一邊工作，一邊自修苦讀日文，後來能直接用日文與造船廠對話，溝通便順暢許多。

這次臺日跨國合作監造船舶的體驗，也讓船舶中心人員親眼見證日本造船廠的先進造船技術，例如使用工業機器人從事電焊作業，縮短約 3 分之 1 的作業時間，第一線監工團隊受益良多，船東也對交船品質滿意，前後共同監造了 4 艘船舶，合作相當愉快。

整合壓艙水與船體系統以配合新法規

與國內造船業者共同造船的經驗，也有不少問題待解決，例如台電公司欲打造自家的運煤船，以便於赴國外運煤，委託台船高雄廠製造 4 艘載重 9 萬 3 千噸散裝貨輪，並由船舶中心負責監造。運煤船的興建攸關國內電力的正常供給，且建造時間緊迫，在規劃與合約階段就必須與時間賽跑。

實際的監造階段也屢逢考驗，台電公司要求要加裝能符合最新法規的「壓艙水處理系統」，船舶進入港域裝載貨物時，會排放出在他港吸入的壓艙水，容易引起有機污染或外來物種入侵，因此國際海事組織（IMO）在「壓艙水國際公約」中，要求會員國透過控制船舶壓艙水排放來減低對環境的影響，雖然我國不是會員之一，但身為國營企業的台電認為有必要做為楷模，依照國際環境保護公約，為海洋環保盡一分心力。

以往船舶建造未加裝過此一壓艙水系統，該系統裝備頗佔空間，耗電量大，工程極為細緻與複雜，加上監造時間有所限制，可謂是前所未見、極具考驗的一大難題。所幸，船舶中心與造船廠的工作人員都很用心盡責，總算不負所託。

行政程序與品質預算面面俱到

船舶中心亦受許多公家機關之邀提供技術服務，但公務艦艇的建造過程有許多細節，且公家機關需依照規定嚴謹進行，各種申請要有書面依據，任何船舶的檢查、稽核與變更，也必須等待簽單通過，始能進入下一個程序。

以船舶中心曾經監造海巡署的巡護艦與救難艦為例，軍艦或巡護船有其固定驗收流程，測試後必須先申報完工，該主管機關才會派人驗收，行政得按部就班作業，要顧及品質，又不能追加預算，可說是千頭萬緒，好在船舶中心監造團隊實戰經驗豐富，協調得宜，成功地頂住多方壓力，最終仍在期限內順利交船。

交船後，在後續人員訓練上，船舶中心仍扮演舉足輕重的角色。造船廠負責規劃課程，讓海巡署的成員學習如何開船與維護，但如何規劃安排課程，均先徵詢船舶中心的意見，一起研擬適當課程；學員若對船的操作功能有疑問，也透過船舶中心整合可執行的意見，一併向造船廠反應。如此到位的服務，也使船舶中心成為客戶心目中最可靠的夥伴。SOIC

台電公司要求要加裝能符合最新法規的「壓艙水處理系統」，船舶中心與造船廠的工作人員都很用心盡責，總算不負所託。

The Taiwan Power Company has asked to install an additional “Ballast Water Management System” which must be in compliance with the latest laws and regulations. Staff at both the SOIC and the shipyard have devoted a considerable amount of time and efforts to accomplish the task.

Kyushu was very dry and cold.

The major challenge was in language communication. Fortunately, the staff appointed to work in Japan could speak a little Japanese; therefore, the staff not only had to work, but also had to learn Japanese in off-duty hours. Afterwards, they were able to communicate directly with the staff of the shipbuilding company in Japanese, and the communication problem was solved!

The ship owner also felt satisfied with the quality of the ships. There was a total of 4 ships built before and after the project.

Regulatory Compliance: Integrating Ballast Water & Hull Structure

What the SOIC have learned in the experiences cooperating with the domestic shipbuilding companies for shipbuilding is that the Taiwan Power Company (TPC) wanted to build their own coal carriers.

The TPC asked to install the “Ballast water management system”, conforming to the latest laws regarding the “International Convention for the control and Management of Ships’ Ballast Water and Sediments” enacted by International Maritime Organization (IMO), which regulated member countries to control the discharging of ballast water in ships to prevent pollution. Although our country was not one of the member countries, the TPC considered that a state-owned enterprise should serve as a model to do something for ocean protection according to the international environmental protection convention.

Previous shipbuilding projects never tried to install ballast water systems of such a large size and high power consumption, and the building process of the system was very troublesome and complicated. In addition, the building time was also limited, which was a real challenge which the SOIC never met before. Fortunately, the SOIC and the staff of the shipbuilding company worked very hard and did not fail our customer in the end.

Administration Procedure Compliance: Achieving High-Quality with a Low-Budget

Taking the project of the patrol vessels and rescue vessels built and supervised by the SOIC for the Coast Guard Administration as an example, as military vessels and patrol vessels have their own acceptance processes, it is necessary to make the finished report of the project after the test, and then the competent authority will appoint their staff for acceptance. All the administration process should be conducted in regular order.

After the delivery of the ships, the SOIC will still play an important role in training staff in the future. The shipbuilding companies are responsible for planning the courses for the members of the Coast Guard Administration in learning how to pilot and maintain the ships. However, all of the shipbuilding companies still need the opinions of the SOIC on which courses are necessary and how to arrange them.

展望 Prospect

從貨輪到軍艦，從經濟、軍事，跨足至綠能及特殊專業領域，船舶中心用 40 年寫下精采的成績。

推動臺灣造船產業揚名國際同時，船舶中心總是不忘照顧內需、整合相關產業，持續提升船舶相關產業的附加價值與合作能量。

未來，因應政府「國艦國造」的重大政策，中心預計整合國內人才、技術、相關產業鏈，以世界船舶生產研發基地為目標，帶領臺灣船舶產業邁向新的紀元。

From cargo ships to warships, our ships are designed to harness green energy and facilitate special demands within the professional domain. With its 40 years of experience, the SOIC has exhibited excellent business performance.

At the same time as gaining global recognition and praise, the SOIC has also taken care of domestic demands and integrated relevant industries, which in turn increased the added value and collaborative power in the ship-related industry.

In response to the government's "Indigenous Defense Submarine (IDS)" policy, the SOIC will take action to integrate domestic talent, technologies and relevant industry chains in the near future. Aiming at becoming a research and development base for global shipbuilding industries, the SOIC is committed to leading the domestic shipbuilding industry to stride towards a brighter future.

擁抱海洋 實現夢想

引領臺灣航向國際

無垠的海洋，蘊藏著無窮的夢想。傳統陸域思維，往往限縮了視野，面向海洋，就能找到臺灣的重要利基；擁抱海洋，就會找到新的機會與希望。船舶中心從臺灣出發，鏈結全世界，為臺灣海洋產業領航，共同實現夢想。

船舶中心 40 年來肩負重責，帶領臺灣船舶及海洋產業破浪前行，持續升級、不斷突破。

For the past 40 years, the Ship and Ocean Industries R&D Center (SOIC) has undertaken the great responsibility to lead Taiwan's ship and ocean industries to move forward, keep upgrading and making breakthroughs.

造船航運是海洋產業之首，40 年來船舶中心肩負著領航重責，帶領臺灣船舶及海洋產業破浪前行，持續升級、不斷突破，造就出國際級的競爭力。多年來，從商船、遊艇到各式船艦的實績成就，在在證明了船舶中心優異的自主設計、規劃及監造能量；而綠能船舶及海洋再生能源的發展，更是船舶中心運用科技能力，為永續地球環境盡心盡力的積極作為。

政府已將國防航太產業列為 5 大創新產業之一，未來將配合「國艦國造」方向，結合產官學界力量，為國家奠定國防自主建設之基礎。

The government has listed the national defense aerospace industry as one of the five major innovation industries. In the future, the government will integrate the powers of the industrial field, the official field and the academic field according to the policy on "Navy Vessel Built Domestically."

聚焦 5 大策略　推動產業前進

船舶中心秉持著「專業、品質、創新、誠信、服務」5 大核心理念，積極推動船舶產業與海洋產業之發展。以船舶設計為核心業務，透過產官學研的緊密合作，培養深厚設計實力，從早期商船船型至今日公務船艦開發，以「專業」領航，成為臺灣船舶設計先鋒。此外，技術服務亦為船舶中心工作重點項目，以「誠信」作為出發點，提供適切而符合需求的審圖、監造及各項「服務」，使船廠與船東合作上更順暢而有效率。有目共睹的服務「品質」不僅是船舶中心的堅持，亦是 40 年屹立不搖的重要根基。為求永續經營，船舶中心更投入各項科專及研發計畫，期以「創新」能量帶領臺灣船舶及海洋產業航向全球。

日前，政府已將國防航太產業列為 5 大創新產業之一，未來將配合「潛艦國造」方向，結合產官學界力量，建立我國潛艦國造之自行設計及維修整補的能量。目前以劍龍級（海龍、海虎）潛艦延壽計畫為基礎，整合國內船舶產業能量，投入潛艦研發與製造，為國家奠定國防自主建設之基礎。

經濟部亦配合政府政策，強化北部及南部之船舶聚落，促進船舶與裝備系統產業密切合作，建構完整船艦級產業，並運用工

Embracing Ocean Realizing Dreams

Shipbuilding & shipping are the heads of the ocean industries. For the past 40 years, the Ship and Ocean Industries R&D Center (SOIC) has undertaken the great responsibility of leading Taiwan's ship and ocean industries to move forward, keep upgrading and making breakthroughs. The practical performances in commercial ships, pleasure boats and various vessels prove the excellent self-design ability, planning and supervising energies of the SOIC. Moreover, the SOIC further develops the green-energy ships and ocean renewable energy sources by excellent technological ability in order create a sustainable environment for Earth.

The SOIC always maintains its five major strategies "professionalism, quality, innovation, integrity, service."Previously, the government has listed the national defense aerospace industry as one of the five major innovation industries. In the future, the government will integrate the powers of the industrial field, the official field and the academic field according to the policy on "Navy Vessel Built Domestically." The service extension plans of the Sward-Dragon class (Sea Dragon, Sea Tiger) submarine will serve as the basis to integrate the energy of the domestic ship industries for the purpose of laying the foundation for the national defense self-construction.

The Ministry of Economic Affairs also enhances the ship groups in the north and south according to the policies of the government to promote the close cooperation between the ship and equipment system industries. The "Military demand drives private industries," "Implement the policy of Navy Vessel Built Domestically" and "Promote the development of area industrial groups" have also become the three major strategies promoted by the government.

In order to match the political targets of the government, the SOIC proposes five major strategies for the ship industries according to the future trends:

1. Develop niche-type ship and equipment systems:

Promote the test and installation of the integration-type system products and introduce the ship supply chain management techniques via the new companies in the supply chain.

2. Prepare key core techniques:

Assist the companies to enhance their technical energy, use the government award and industrial cooperation resources to introduce the key ship technologies in Taiwan.

3. Promote and expand domestic demand market:

Promote the "Navy Vessel Built Domestically" policy, establish the national defense ship industrial groups in the north and south, and promote the development and expansion of the domestic ship integration system.

發展策略

業合作等資源，協助船艦產業引進關鍵技術，以利我國國防船舶產業發展。此外，「從軍需帶動民間產業」、「落實國艦國造政策」、「促進區域產業聚落發展」也成為政府主要推動的 3 大策略。

為連結政府政策目標，船舶中心展望未來趨勢，聚焦船舶產業提出 5 大重點策略：

一、**發展利基型船舶及裝備系統：**以國內供應鏈新廠商的投入，推動整合式系統產品測試及安裝，並引進船舶供應鏈管理技術，建立「MIT」品質保證，將可應用資源與發展利基根植於國內。

二、**籌建關鍵核心技術：**輔導廠商提升技術能量、運用政府獎勵及工合資源引進船舶關鍵技術。建立自主創新及前瞻技術之開發能力，透過整合、分享，墊高產業基礎。

三、**推動擴大內需市場：**推動國艦國造、建立南部與北部國防船艦產業聚落、促進國產化船用整合式系統開發及拓展。期能帶動關聯產業與就業發展，範疇自船舶至整個海洋產業。

四、**協助國內廠商取得國際認證：**輔導產業鏈建立起船舶品質保證系統、並協助業者申請 CE、RINA 及其他國際船級協會驗證，使臺灣船舶產業能放眼亞洲、立足全世界。

五、**船舶產業人才培育：**推動產官學研整合，使學界研究能配合產業需求，提出實質貢獻，並透過官、產之扶植，培養學界人才，藉以厚植臺灣船舶暨海洋產業之設計與研發能量。

展望未來　擘畫願景

船舶中心的產業發展願景是「使臺灣成為具高附加價值的船舶生產研發基地」，期望以「國艦國造」連接「軍方到民間」，整合國內供應鏈帶動市場經濟，創造船舶產業練兵機會。

期以「離岸風電及特種船舶」連接「過去到未來」，運用國際工業合作，突破我國離岸風電及海事工程船舶研發建造能量，創造高值化船舶商機；以「高附加價值船舶／核心次系統」連結「在地到全球」，提升國內裝備廠家聚落能量，成為高附加價值核心零組件與次系統之生產製造基地，拓展至國際市場。

隨著近年業務穩健成長，而為承接國艦國造之發展重任，未來也將陸續吸納國內頂尖船舶專業人才，持續深化船舶中心專業能量，並且發揮產業上下游整合力道，積極開展無限可能。在遼闊無際的海洋中，臺灣就像是一艘船艦，船舶中心願為動能引擎，讓我們懷抱著信心與希望，共同承擔責任、迎接挑戰，朝向世界啟航出發。SOIC

船舶中心的產業發展願景，是「使臺灣成為具高附加價值的船舶生產研發基地」。（圖片提供：中央通訊社）

The industrial development vision of the SOIC is to “make Taiwan become a ship production/R&D base with high added-value”

4. Assist domestic companies to obtain international certifications:

Assist the establishment of the ship quality assurance system and assist the companies to apply for the CE and RINA verifications.

5. Develop talents for ship industries:

Promote the integration between the industrial field, the official field and the academic field to promote the experienced talents for the ship industries.

It is expected to connect “the offshore wind power generation and special-purpose ships” with “the past to the future.” The SOIC will break through the R&D and manufacturing energies of the domestic offshore wind power generation and the ocean engineering ships via the international industrial cooperation. In this way, high-valued ship business chances can be created through the connection between “the high added-value ship/core subsystem” and “the local to the global,” the energies of the domestic equipment company groups can thus be enhanced to create a production/manufacturing base of the high value-added core components and sub-systems, and then the base will extend to the international market.

The industrial development vision of the SOIC is to “make Taiwan become a ship production/R&D base with high added-value”

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發行所／財團法人船舶暨海洋產業研發中心
發行人／劉金源
編審委員／柯永澤、陳錦福、林鴻志、吳兆誠、謝曜安、邱垂嘉、陳明忠、周顯光、詹明憲
編輯／陳林福、王水連、李旭成、鍾承憲、江載敏、劉建宏、陳聖樺、莊賀傑、張歆甜
地址／新北市淡水區中正東路二段 27 號 14 樓
電話／ (02)2808-5899
傳真／ (02)2808-5866
網址／ www.soic.org.tw

編輯製作／商周編輯顧問股份有限公司
總經理／李國榮
專案經理／林睿騰
企劃／張舒文
執行編輯／李順瑀
地址／台北市中山區民生東路二段 141 號 6 樓
電話／ (02)2505-6789
網址／ www.bwc.com.tw