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IDA World Congress Opens on August 30



The most eagerly anticipated event for the global desalination and water reuse community, the IDA 2015 World Congress on Desalination and Water Reuse opens on August 30 at the San Diego Convention Center in beautiful San Diego, California.

Held every two years since 1987, the IDA World Congress brings together public and private sector leaders in the world's desalination and water reuse community, from end-users to technology developers, suppliers, researchers,

academics, consultants, engineers and financial services providers.

This year's World Congress features a four-day Technical Program, 11,000 square-meter Exhibition, IDA Academy courses, and abundant networking opportunities throughout the Congress week including "A Celebration of California" at the Birch Aquarium at Scripps Institution of Oceanography.

The program also features tours of the soon-to-be commissioned Carlsbad desalination plant, the

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message

from the President

Dr. Abdullah Al-Alshaikh



Capitalizing on Change

There is a great piece in the June 29th edition of the New Yorker magazine entitled "Power to the People, Why the Rise of Green Energy makes Utility Companies Nervous." It outlined the paradigm shift that is happening beneath our feet. The paradigm shift has direct impact on the energy-food-water nexus – thus, the nervousness of utility companies who suddenly find themselves in a vastly changing world.

In a sense, we all have reason to be nervous: that is, if we find ourselves uncomfortable or unable to embrace change wholeheartedly, and if we are holding onto a past that is slipping away and are not fully engaged in our future. Do not underestimate that our industry, the industry of water desalination, treatment and reuse, is at ground-zero for change.

We live in a time of change that occurs with great leaps and bounds, not small incremental steps, but rather an age of "Disruptive Innovation," as Clayton Christensen calls it. This change is a tidal wave that has reached our shores, across industries and in our private lives. As we in our industry stand before this wave – a third industrial revolution – we must decide either to swim with it or be drowned. We will either lead or follow.

At IDA, we have worked tirelessly to lead and to ensure that we stay in front of change, and that our organization remains dynamic, capable of adopting change to our benefit. Today, in 2015, we act as a reinvigorated organization,

having reviewed and recalibrated our organizational strategy and now rebranding ourselves.

We have encouraged more broad and active participation within the IDA Board and promoted a diversity of membership to enable the next generation of industry leaders. For the first time, South America and Brazil will host the 2017 World Congress in São Paulo, representing one of the most important growth markets for our industry.

We are promoting the principles of circular economy, shifting more focus than in the past on water reuse. We are planning our first water reuse conference in Nice, France for September 2016. We have reframed our vision and mission statements to include sustainability, and have advocated the commercializing and adaptation of new technology.

We are continuously increasing our efforts in learning and development. The IDA Academy and our numerous workshops and conference are central tenets of what we do. We have encouraged collaboration and the coming together of a broad range of interests including corporations, government, R&D, academia and individuals within the industry.

These are all important steps to prepare ourselves for the future, but they are dwarfed by the work and the change that lies ahead. There are much bigger things to come, and much of this rests on the organization's commitment to sustainability, defined not merely in terms of how IDA promotes within our industry those

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Capitalizing on Change

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environmental practices and technologies that are demanded by new regulations and policy, and by the communities our industry serves, but also in economic and social equity terms.

IDA's commitment to sustainability must be based on a deep and holistic understanding.

Sustainability entails changing the economic paradigm of our industry, slashing the costs of operating through energy-efficient technology (e.g., recovery devices) and renewable energy supply (e.g., solar), smart technology and automation, material design (e.g., nanotechnology and graphene), etc. Changing the cost structures of our industry opens new markets and unlimited expansion so that desalination and water reuse are more easily accessible to a greater number of people throughout the world, in turn having an impact on social equity

as measured in sustainable terms that ensure the future of water as an abundant resource. Harry Truman once said, "Men and women make history, and not the other way around. In periods where there is no leadership, society stands still. Progress occurs when courageous, skillful leaders seize the opportunity to change things for the better."

Serious commitment to sustainability on the part of IDA requires leadership and vision, not just in the positions of organizational leadership, i.e., the Directors, but on the part of all, including our members, affiliates and individuals associated with IDA. Together, we must push toward greater heights and reach for more than we ever imagined as the opportunities lie before us, as change engulfs our world. IDA is at a pivotal moment in its history upon which it is set to capitalize.

IDA World Congress Opens on August 30

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largest seawater desalination plant in the Western Hemisphere, and the Orange County Groundwater Replenishment System, the world's largest water purification system for potable reuse.

The 2015 World Congress incorporates several new program highlights. Nine open forum discussion panels will explore key issues surrounding reuse and desalination, and an Innovation Theater will provide an opportunity for entrepreneurs and solutions providers to showcase new products and services. In addition, the IDA World Congress will include an Education Day for middle school students and an invitation-only session for community leaders engaged in water treatment and conservation programs.



This is the second time that the IDA World Congress will be held in San Diego – the first time was in 1999. Considered to be the epicenter of desalination and water reuse development in the USA, the San Diego area is a hotbed of innovation and the home of many of the industry's leading membrane manufacturers, universities, research and development centers, project developers and industry leaders.

The location, theme and timing of this World Congress could not be more appropriate. The theme, "Renewable Water Resources to Meet Global Needs," is particularly relevant, with California suffering from a record-breaking drought that is generating an extraordinary interest in reuse and desalination.

"The World Congress is a forum for vital discussions taking place surrounding the growing demand for a sustainable source of fresh water in response to population growth, economic expansion, degradation of existing resources, and the effects of climate change," says Patricia A. Burke, IDA Secretary General.

Topics in the Technical Program – the largest in World Congress history – include emerging technologies; environment and sustainability; brackish and seawater water desalination; water reuse and disinfection; industrial water and wastewater treatment; thermal desalination; pre- and post-treatment; governance, finance and project delivery; and plant operations and optimization.



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IDA World Congress Opens on August 30

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Awards totaling more than \$25,000 US will be presented including those for Best Papers in such categories as Environment and Sustainability, Innovation, Research & Development, State-of-the-Art in engineering practices, and presentation by a member of IDA's Young Leaders Program. In addition, delegates can vote for winners in three categories: Best Moderator, Best Presenter and Best Poster.

Two events are co-located with the IDA 2015 World Congress. Held on August 28-29, the DesalTech 2015 Conference will focus on Research in Emerging Water Desalination Technologies for Municipal and Industrial

Applications. It is co-organized by the National Water Research Institute (NWRI), National Centre of Excellence in Desalination Australia (NCEDA), and KAUST Water Desalination and Reuse Center (WDRC). In addition, the American Membrane Technology Association (AMTA), IDA's North American affiliate, will hold a pre-conference workshop on August 30 titled, "The Pioneers and the Present –The North American Story."

Please note that attendance at the Birch Aquarium event is limited. The plant tours are currently full but a waiting list will be available at the on-site registration desk.

[More information.](#)

Desalination – The Real Australian Story



By Neil Palmer

I have lost count of the number of times I have heard, “The Australians spent billions on desalination plants and now they have turned them all off because it rained – they are not needed. California should not repeat Australia’s mistake.”

I can understand some US desalination critics bringing this up – they won’t know any better. But I have been astonished that some Australian commentators have expressed it.

The facts are, Australia faced its worst drought in a thousand years, lasting 13 years from 1997 to 2009. It was brought on by El Nino, warming Pacific Ocean waters, which brings drought to Australia. As we approached 2005, it became evident that major capital cities could run out of water. Had the drought continued another few years, it would have happened. Can you imagine what the critics would have said had the drought continued and nothing been done?

Despite the comments of those appearing to be wise after the event, doing nothing was unthinkable. So water utilities built six world class seawater desalination plants in all five mainland state capital cities at a cost of around \$A10billion. Funded by water consumers, the entire program took just eight years (from 2004 to 2012) and included land acquisition, financing, design, construction, commissioning and all environmental permitting. This was an incredible achievement and one of which all Australians should be proud. The four Eastern

states plants where rain has fallen since construction (Gold Coast, Sydney, Melbourne and Adelaide) provide affordable insurance against inevitable future droughts.

The Bureau of Meteorology announced on June 25 that El Nino conditions have now returned to the Pacific Ocean. Inland Queensland and New South Wales have already been in the grip of drought for more than three years. Broken Hill, a major inland city, has less than 12 months’ water supply remaining because the

Darling River has stopped flowing. They are turning to desalination of brackish ground water to extend their supply by a further 12 months.

But in Western Australia, after 30 years of drought, rain has not fallen. The two large desalination plants (which supply half of Perth’s drinking water) were not built in any sense of panic, but as part of a deliberate long-term strategy to build water security “whatever the weather.”

Perth’s inhabitants consume, on average, 130 kL of water per person per year. This is equivalent to 94 US gallons per person per day – it was more before successful water conservation campaigns were introduced. In a drying climate, water security is important to Western Australians and ensures it remains an immensely attractive and livable city of some 1.9 million people.

Unfortunately, the vocal Australian desalination critics mentioned earlier have apparently forgotten that Western Australia is part of Australia.

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Desalination – The Real Australian Story

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So the real Australian desalination story is this: we had a natural crisis (the Millennium drought) but responded with an incredible fast-tracked program of construction of climate-resilient water supplies from an inexhaustible source – the ocean. All of the mainland state capital cities have water security when the next drought occurs.

But in Western Australia, seawater desalination was carefully planned and now provides base load water making up around 50% of the total demand. It is sustainable and will continue to do so for the foreseeable future. They will never be “turned off.”

As a footnote, I read an article from NASA last week, which talked of the world water cycle.

They have assessed that people use some 9,000 cubic km of fresh water each year for all their needs (drinking, industry, irrigation and recreation). But the total consumption is dwarfed by production of 450,000 cubic km each year of naturally desalinated seawater evaporated from the world’s oceans. [Read the story here.](#)

Remember that next time you hear someone knock desalination.

A Director of the International Desalination Association, Neil Palmer is Chief Executive officer of the National Centre of Excellence in Desalination Australia. He was voted No. 1 on Water & Wastewater International's list of the top 25 leaders in the global water industry by readers of that magazine. He can be reached at Neil.Palmer@murdoch.edu.au.

California Waves the Red Flag at Big Desal Projects



By Christopher Gasson

This May, the California State Water Resources Control Board adopted new standards for desalination intakes and outfalls. It is a new area of regulation in the US, and the state presumably felt that it wanted to take the lead with a gold standard of environmental protection that might be adopted all over the world, like its successful Title 22 water reuse standard. The problem is that the regulations make large-scale desalination plants well-nigh impossible.

Under the new rules, screened surface intakes will be permitted only after subsurface intakes are determined to be unfeasible. On the outfall side, the salinity must not exceed the natural background salinity by more than 2.0 ppt beyond a 100m dilution zone. These requirements are pretty easy to meet if you want to build a 5,000m³/d desalination plant, but if you want a 500,000m³/d plant, then you will need to find a different state.

Most desalters are probably quite happy to wave goodbye to the Californian desal market. It is a horrible place to work: the approvals process for desalination plants seems to have been designed by Franz Kafka and Hieronymus Bosch. The real risk is that naïve water regulators around the world will think that California has developed the gold standard for environmental protection, and that they should adopt similar standards.

The art of good regulation is to balance the need to build public confidence in a certain

way of doing things without putting so many obstacles in the way that it kills the business. If you get it right – as California did with Title 22 – the benefit in terms of increased opportunity resulting from greater public support more than outweighs the costs imposed by the regulation. The question for those regulating desal intakes and outfalls is determining what level of intervention is required to win public confidence.

The problem is that it is genuinely difficult to regulate the impact of intakes and outfalls. There has been no systematic research on the subject measuring the before and after impact of desalination plants on marine life over a number of years at different desalination plants with different locational factors. In the absence of proper scientific guidance, the state water resources control board seems to have taken a “better safe than sorry” attitude and come up with a set of standards that are as extreme as they possibly can be. It is reminiscent of the early days of motor-powered vehicles, when in the absence of good data, crazily restrictive regulations were introduced, such as the 1865 Red Flag Act in the UK (requiring a speed limit of 4mph and the requirement that a man should walk ahead of all self-propelled vehicles carrying a red flag).

The Pacific Ocean is 10 billion times larger than the daily output of every desalination plant in the world added together. It is quite possible that you could build a million cubic meter a day plant in Southern California with open intakes and still have no measurable impact on the quantum and variety of marine life in the coastal area. Other factors, such as ocean cooling and warming and the demographic cycles

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California Waves the Red Flag at Big Desal Projects

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of predators and their prey, could have a bigger impact – we simply don't know.

It presents an interesting challenge for the industry. If we are seen to question California's new standards, we might come across as being barbarously anti-environmental, and in doing so justify the perceived need for tough regulation. If we keep quiet, then there is a very real risk that California's standard will be more widely adopted. It would kill the large-scale desalination industry.

The International Desalination Association is holding its 2015 World Congress in San Diego this August. Although we will want to impress the Californians by how green we are as an industry, we must also make the case that good policy needs to be based on good science before it is set in stone.

Christopher Gasson is publisher of Global Water Intelligence. He can be reached at cg@globalwaterintel.com. This article was originally published in the May 21, 2015 edition of GWI.

Building a Better Hole



By Tom Pankratz

An RO membrane is an amazing thing. For about one dollar, you can buy one square foot of virtually defect-free RO membrane material with the ability to desalt more than 10

gallons of water a day with predictable performance, continuously and under high pressure, for five years or more. The membranes can be obtained from at least eight different suppliers, are more or less interchangeable, and available in a variety of models offering unique performance characteristics for a wide range of applications.

If we assume that a SWRO operates at the thermodynamic limit, with 100 percent efficient pumps and energy recovery devices, and without any concentration polarization or frictional losses, a single-stage unit operating at 50 percent recovery would have an energy consumption of 1.56 kWh/m³ (5.9 kWh/kgal). This is within 25 percent of the energy consumption reported for some well-designed pilot and commercial installations—which employ a \$1 per square foot membrane that was developed over 25 years ago.

So, what are we to think of the press releases and investor prospectuses that claim a performance that is 100 or even 1,000 times higher than those available with conventional membranes, or from those who promise energy savings 66 percent higher than conventional systems? Will graphene, carbon nanotubes and other nanotechnologies really be able to deliver what their sales agents claim?

The proponents of one new nanotechnology-based membrane technology claim that it has unprecedented selectivity, is only one atomic layer thick and can be integrated with a forward osmosis system. They say that it could be incorporated into a cartridge that is half the size of a shoebox and is able to desalt 400 cubic meters (100,000 gallons) of seawater per day at an energy consumption that is 66 percent lower than today’s best RO systems.

What you get for \$1.00 per square foot

A modern RO membrane is actually a thin-film composite (TFC) manufactured of three different materials that are bonded together. Most membranes have an active layer made from a thin-film semipermeable of polyamide material that is cast onto a microporous support layer, which overlays a reinforcing fabric.

Once you’ve invented and built a better hole, it is still necessary to build a system. You must also have a means of delivering a consistent volume of water, an effective pretreatment system and a means of controlling biofouling. Then you have to deal with osmotic pressure and concentration polarization while providing an efficient way to evacuate the rejected solids to prevent scaling.

As one membrane scientist notes, “If you walk a chemist through a SWRO plant, they will quickly realize how small a part of the plant the membrane actually is, and therefore, how difficult it is to really move the dial.”

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Building a Better Hole

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These observations are not meant to imply that there isn't room for improvement in today's membrane technology. There is exciting membrane research underway around the world, and there are many applications that will take advantage of the next generation of membrane materials and membranes now being developed.

And, for many more years, the humble RO membrane will continue to do amazing things at a remarkably affordable price.

Pankratz is the editor of Water Desalination Report, a weekly newspaper that has been following the desalination industry for 50 years. He regularly reviews and writes about new desalination and water reuse technologies.

Mayor of San Diego to Welcome Delegates in Opening Ceremony



The Honorable Kevin L. Faulconer, Mayor of San Diego, California, has joined a prestigious line-up of speakers from around the world to welcome World Congress delegates to this iconic city during the Opening Ceremony.

Mayor Faulconer became the 36th mayor of San Diego in 2014. He has been active in efforts to protect water resources and the environment as well as create opportunities in the water sector.

A supporter of the Carlsbad desalination plant to augment the water supply to the region, he has also pushed for the new Pure Water System, an innovative water-recycling program, to build a sustainable water source that will provide more than 30% of the city's water needs. In addition, he initiated the first Blue Tech center of excellence to incubate innovative companies in the city's maritime economy, and negotiated a landmark Climate Action Plan to reduce greenhouse gas emissions by 50% within 20 years.

According to the San Diego Tribune, "Faulconer unveiled a new city blueprint for fighting climate change that would use new regulations and incentives to cut San Diego's carbon emissions in half by 2035. Environmental groups and business leaders have both generally praised the plan as ambitious, but also realistic and doable."

"With California in the midst of a historic drought, we must all do our part to conserve

water and find innovative ways to increase our water supply," Mayor Kevin L. Faulconer said. "San Diego continues to be a hub for research and developing new technologies that will help give future generations access to the water they need. We look forward to hosting some of the world's top leaders in the fields of desalination and water reuse at the IDA World Congress."

Other confirmed keynote speakers include Dr. Abdullah Al-Alshaikh, IDA President; Mark Weston, Chairman of the San Diego County Water Authority Board of Directors; H. E. Abdullah bin Abdul Rahman Al Hussein, Minister of Water and Electricity, Saudi Arabia; and Dr. Benjamin Cook, research scientist at the NASA Goddard Institute for Space Studies and lead author of a recent NASA study linking carbon emissions with increased risk of megadroughts in the USA. Paddy Padmanathan, President of ACWA Power International, and Vahid Ownjazayeri, President, Global Civil & Infrastructure, AECOM, will also speak during the Opening Ceremony, as will Technical Program Co-chairs Doug Eisberg and Dr. Richard L. Stover.

"A Celebration of California" at the Birch Aquarium: IDA Sponsored Special Event

This year's World Congress features a sponsored special event that raises a toast to California, birthplace of membrane desalination and reuse.

One thousand local and international guests will enjoy a behind-the-scenes look at the Birch Aquarium in San Diego on Tuesday, September 1 from 6:30-10:30 p.m. World Congress delegates will be transported via motorcoach from the San Diego Convention Center to the Birch Aquarium, the

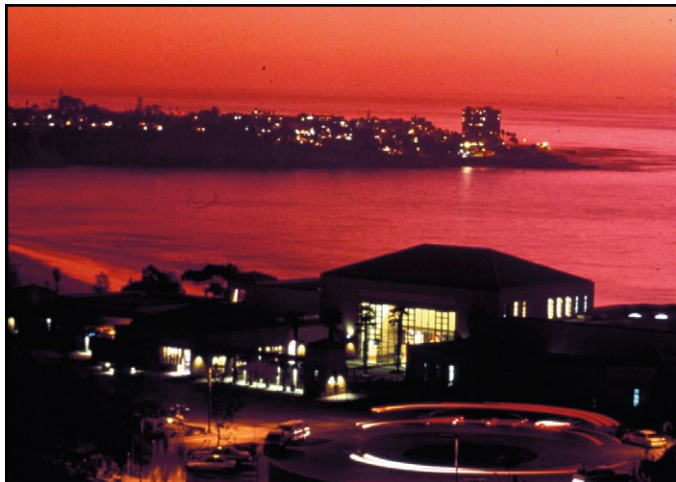
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public exploration center for the world-renowned Scripps Institution of Oceanography at the University of California at San Diego. The Aquarium is perched on a bluff overlooking the Pacific Ocean, and delegates may stroll throughout the facility, experiencing stunning views inside and out for a true California experience.

Food and beverage will be located in several areas throughout the venue, and guests are encouraged to explore the Aquarium and its creative exhibits featuring more than 60 habitats of fishes and invertebrates from the cold waters of the Pacific Northwest to the tropical waters of Mexico and beyond. There will be a raffle for an iPad Air as well as plenty of opportunities for networking.



Photograph from Birch Aquarium

An exclusive California Celebration Night menu has been exclusively designed by San Diego's own Culinary Concepts Catering to create the perfect dining experience for this special event.

Attendees can take in the Aquarium's many exhibits during the events. Current exhibits include:

Boundless Energy – Get charged up about the future of energy at Boundless Energy, Birch

Aquarium's new interactive exhibit celebrating the innovative ways we can use natural forces to power our lives. Discover how we can harness the renewable energy of the wind, sun and waves to assure a bright future for us all – one with clear skies, clean water and healthy oceans.

There's Something about Seahorses – Saddle up for a close encounter with the sea's most captivating creature. See more than a dozen seahorse species and their relatives, visit babies in the special seahorse nursery, investigate what makes the seahorse a fish, and discover Birch Aquarium's award-winning efforts to conserve this threatened animal.

Feeling the Heat: the Climate Challenge – Explore the scientific facts behind climate change and global warming with this exhibit highlighting Scripps' half century of climate research.

Major exhibits within the Aquarium include:

Hall of Fishes, with more than 60 tanks of Pacific fishes and invertebrates from the cold waters of the Pacific Northwest to the tropical waters of Mexico and the Caribbean. The largest habitat is a two-story 70,000-gallon kelp forest.

ElasmoBeach, a 13,000-gallon tank featuring La Jolla's legendary leopard sharks and other species of elasmobranchs (sharks and rays) that make their home in local waters. Visitors will discover why these sharks are critical to the ocean's health and why the area off La Jolla Shores is so important to them.

Tide-Pool Plaza, three living tide pools where visitors can touch and learn about pool inhabitants. Windows in the habitats provide up-close views of starfish, hermit crabs, sea cucumbers, lobsters and

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other animals local to San Diego's tide pools. The pools overlook La Jolla and the Pacific Ocean.

"The Legacy": Gray Whale Sculpture Fountain.

Located in front of Birch Aquarium at Scripps, this life-size exhibit features a gray whale family. The 40-foot-tall bronze whale, sculpted by Randy Puckett, offers visitors an immediate sense of scale for these ocean giants. Interpretive panels provide more information about gray whales and their annual migration past our shores. When installed in 1996, the exhibit featured the largest bronze whale in the world.

Mexican Seas/Mares Mexicanos, an exhibit featuring the awe-inspiring photography and fascinating research of Octavio Aburto, assistant professor of marine ecology at the Center for Marine Biodiversity and Conservation at Scripps Institution of Oceanography. The exhibit takes visitors on an intimate photographic journey to four unique biodiversity hot spots in Mexican waters and offers stunning views of the marine life that thrives in these protected areas. His photographs, and the corresponding conservation stories, capture "the art of science" and seek to inspire ocean stewardship.

Arrangements have been made to keep the book and gift shop open during the event. The Aquarium's book and gift shop carries a wide selection of informative field guides, books about the ocean and near-shore environments, marine-themed toys, clothing, jewelry, fine art and more.

A special thank you to our supporting affiliate American Membrane Technology Association (AMTA) and our event sponsors:

- Alkema Solutions, Inc.
- ARCADIS

- Avista Technologies
- Biwater
- Carollo Engineers
- CH2M Hill Company
- Consolidated Water Company (CWCO)
- Energy Recovery, Inc.
- GHD Pty Ltd
- Hazen and Sawyer
- Hydranautics
- LG Chem
- Metropolitan Water District of Southern California (MWD)
- Michael Baker International
- Orange County Water Department (OCWD)
- Piedmont Pacific
- Poseidon Water
- Professional Water Technologies
- Protec Arisawa America
- R. L. Truby & Associates
- San Diego Water Authority (SDCWA)
- Sacyr Environment USA
- Toray ne USA

Please note that, due to space limitations, only registered delegates and representatives of event sponsors are eligible to attend.



Photograph from Birch Aquarium

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Meet Our Affiliates at IDA's Global Village

Delegates at the World Congress will get a chance to get up close and personal with IDA's affiliates at the Global Village, located at IDA's booth, #1135. Be sure to stop by to meet representatives from several affiliate organizations and learn about our affiliates' important role with IDA and the global desalination and water reuse community.

American Membrane Technology Association (AMTA)

AMTA's mission is to promote, advocate and advance the understanding and application of membrane technology to create safe, affordable and reliable water supplies, and to treat municipal, industrial, agricultural and waste waters for beneficial use.

Asociación Española de Desalación y Reutilización (AEDyR)

AEDyR was created in 1998 after the successful IDA World Congress held in Madrid in 1997. IDA added AEDyR to its affiliate network in recognition of its technological development and record in desalination. This association intends to gather all individuals, companies and organizations dealing with desalination and water reuse in Spain. AEDyR is one of the world's few non-regional, country-specific desalination associations.

Asociación Latinoamericana de Desalación y Reuso de Aguas (ALADYR)

One of ALADYR's main missions is to promote, protect and develop engineering, construction,

technological applications and developments as well as equipment and materials for desalination and water treatment projects. ALADYR also represents its members when dealing with public and private organizations that are either directly or indirectly related to its activities. ALADYR promotes the professional development of its members and the generation of new knowledge within this sector.

Australian Water Association (AWA)

The Australian Water Association (AWA) is the national peak water organization, delivering information, expertise and collaboration for sustainable water management. AWA's membership is broadly-based and multi-disciplinary, covering the entire water cycle. AWA provides the platform for our water experts, practitioners and businesses to share information, grow expertise and collaborate effectively.

Caribbean Desalination Association (CaribDA)

CaribDA is a non-profit organization and represents members/sponsors from the Caribbean desalination and water reuse communities, utilities, industries, academia and government as well as individuals interested in water supply improvement in the Caribbean, specifically by means of desalination or water reuse. CaribDA welcomes interest from NGOs and students from all disciplines interested in desalination and water reuse.

European Desalination Society (EDS)

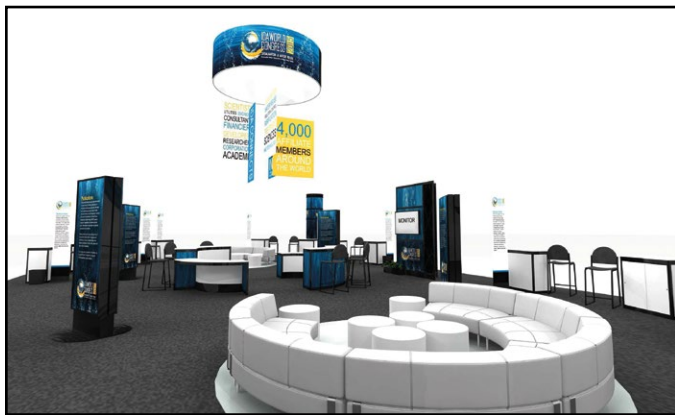
EDS is a Europe-wide organization for individual and corporate members including universities, companies, research institutes, government agencies and all concerned with and

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interested in desalination and membrane technologies for water.



Pakistan Desalination Association (PakDA)

PakDA is a non-profit organization and represents members and sponsors from the Pakistan desalination and water reuse communities, utilities, industries, academia and government as well as individuals interested in desalination and water supply improvement in Pakistan, especially by means of desalination and water reuse. PakDA welcomes NGOs and students from all disciplines interested in desalination and water reuse.

The IDA booth will have information about all IDA affiliates:

Regional Affiliate Members

American Membrane Technology Association (AMTA)

Asociación Española de Desalación y Reutilización (AEDyR)

Australian Water Association (AWA)

Caribbean Desalination Association (CaribDA)

European Desalination Society (EDS)

Japan Desalination Association (JDA)

Levant Desalination Association (LDA)

Water Desalination Engineering Chapter (WDEC)

Association Affiliate Members

Asia Pacific Desalination Association (APDA)

Asociación Latinoamericana de Desalación y Reuso de Aguas (ALADYR)

Indian Desalination Association (InDA)

Korea Desalination Plant Association (KDPA)

Pakistan Desalination Association (PakDA)

Singapore Water Association (SWA)

The Membrane Industry Association of China (MIAC)

Water Science and Technology Association (WSTA)

Congress Communications

The IDA World Congress will feature a number of communications tools to keep delegates informed and connected throughout the week including:

Mobile App



Up-to-date information is just a tap away with the World Congress app. Find out more about speakers, discover details about technical sessions, navigate the exhibit hall and vote for winners in the new award categories on your mobile device. The app provides access to the

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Exhibition floor plan and exhibitor profiles, plus information about topics and authors in the technical sessions. You can also vote for Best Moderator, Best Presenter and Best Poster, and non-members can join IDA through the app.

The mobile app is now available for download.

Networking Lounges

Re-charge yourself and your electronic devices at the networking lounges located in the Exhibition Hall. These attractive and comfortable lounges are a good place to meet fellow delegates, conduct one-on-one meetings and just relax in general. The lounges also feature complimentary WiFi and charging stations so you can stay in touch throughout the day.

Cyber Cafés

Power up at the Cyber Cafes. Charging stations are located near the technical sessions and offer a great way to meet other delegates while charging your phones, iPads or laptops.

Information Kiosks

Navigation at the World Congress is easier than ever with information kiosks strategically located throughout the venue. You can search for exhibitors, products and sessions, quickly identify their location on the floor plan, and view a route to your destination. There are four kiosks in all – two near the Technical Program and two downstairs, near the Exhibition.

A special thanks to our generous sponsors who are keeping us connected and refreshed:

- Network Lounge and Cyber Café Sponsor: IDE Technologies

- Refreshment Break and Cyber Café Sponsor: Abengoa
- Network Lounge Sponsor: ROPV
- Mobile App Sponsor: Acciona Agua
- Information Kiosk Sponsor: Sidem Veolia

Innovation Theater: Expanding Horizons at IDA World Congress



The 2015 IDA World Congress introduces The Innovation Theater, a new venue within the Exhibition to showcase ideas and expand knowledge. Be sure to stop by and learn about industry innovations from top experts. The schedule at press time follows, and updates can be found at wc.idadesal.org. A special thanks to the Innovation Theater Sponsor, Suez.

Monday, August 31

2:00-2:30 p.m.

Acciona Agua: "Engineering the Water Energy Nexus through Innovation in Desalination and Water Reuse" presented by Jorge Malfeito and Marina Arnaldos

2:45-3:15 p.m.

Acuamed: "New Conventional Resources in the Context of Water Planning" presented by Gabriela Manueco and Angel Cajigas

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3:30-4 p.m.

Avista Technologies: "Advancement in Membrane Foulant Analysis Using Chromatic Elemental Imaging" presented by Sara Pietsch

Tuesday, September 1

10:00-10:30 a.m.

TPTec (Thermal Purification Technologies): "Efficient ZLD Using LTDis and LTDry: presented by Espen Mansfeldt

10:45-11:15 a.m.

Spiral Water Technologies: "Award Winning Spiral Water Automatic Filter" presented by Ashwin Gulati

11:30 a.m.-Noon

LG Chem: "LG Chem Water Solutions" presented by Nicholas Dyer

2:00-2:30 p.m.

Suez: "A Look into the Future of Seawater Desalination: Masdar Project" presented by Miguel Ángel Sanz and Sophie Bertrand

2:45-3:15 p.m.

Marine Tech: "A New Technology to Reduce Desalination Production Costs" presented by Sophie Bertrand and Thierry Carlin

3:30-4:00 p.m.

Ocean Pacific Technologies: "Axial Piston Pumps Bring Efficiencies" presented by John MacHarg

Thursday, September 3

10:00-10:30 a.m.

Adionics: "Selective Solvent Extraction of Salts from Water by Means of Fluorinated Organic Solvents" presented by Thierry Darde

10:45-11:15 a.m.

Piedmont Pacific: "Changing PX and UF Modules with Ease and Safety" presented by Simon Bouchard

11:30 a.m.-Noon

Salt Water Solutions: "A New Way of Designing with RO Membranes" presented by Darren Szczepanski

MASDAR Holds Workshop at IDA World Congress



MASDAR will present Abu Dhabi Water Hub – Advancing Innovative Technologies, a 90-minute workshop on Monday, August 31. Open to all attendees, the workshop focuses on its highly reported desalination project to test and develop advanced energy-efficient seawater desalination technologies suitable to be powered by renewable energy sources. The long-term goal of the program is to implement renewable energy-powered desalination plants in the United Arab Emirates and to have a facility at commercial scale by 2020.

Speakers include Mohammad El Ramahi, Associate Director, Asset Management, Engineering and Operations, and Alexander Ritschel, Senior Manager, both from MASDAR. The workshop will be held in the Technical Program area.

Thank You, World Congress Sponsors!

IDA wishes to acknowledge our World Congress Sponsors. As one of the world's leaders in our industry, your support of the World Congress reinforces its position as the top global event for desalination and water reuse.

SALINE WATER CONVERSION CORPORATION – OFFICIAL CONGRESS SPONSOR

The corporation seeks to achieve the overall objectives of Saudi Arabia's five-year development plan its provision of sufficient quantity of desalinated water through: water production, electricity production, desalinated water transfer, desalinated technologies research and human resources.

Water production: SWCC produces pure drinking water in single or dual-purpose desalination plants. It owns and maintains 28 desalination plants in 17 locations on Saudi Arabia's eastern and western coasts producing desalinated water at 4.6 million m³/d. SWCC produces 69% of the kingdom of Saudi Arabia's desalinated water daily output of 6.6 million m³, with the rest produced by independent plants from the private sector. The kingdom produces 54% of the Arabian Gulf countries' output and of 18% of global production.

Electricity production: Parallel to desalinated water production, The SWCC generates power through its dual-purpose plants in which part of the power generated is used to operate Multi Stage Flash desalination with the remaining power exported to the Saudi Electricity Company. The SWCC produces 12% of the total electricity generated in the kingdom.

Desalinated water transfer: SWCC supplies fresh water to beneficiaries through a 5,600 km network of pipelines with 45 pumping stations constantly pumping water to its 243 reservoirs with a total capacity of 11,6 million m³. The network includes 15 mixing stations that blend desalinated water with groundwater.

Desalination technologies research: Scientific research plays a pivotal role in the growth and development of economies by meeting industry's challenges

المؤسسة العامة لتحلية المياه المالحة
Saline Water Conversion Corporation



and extending the horizons of knowledge. The kingdom's five-year development plan has focused on the importance of scientific research in water desalination as reflected in its housing of the largest water desalination research institute in the Middle East. SWCC is a world-class provider of high-quality, research-based solutions in desalination. Researchers from the institute have pioneered numerous technologies that have reduced the cost of desalination and preserved the environment.

Human Resources: SWCC accords a high priority to the development of its national workforce's capabilities to operate and maintain its facilities. It encourages its employees to participate in specialized seminars and other training. SWCC has recently intensified its training programmes provided to its employees by the center at Jubail. The corporation has also provided scholarships to support a number of its employees in studies for higher academic qualifications. The SWCC employs 10,000 employees of which 90% are Saudi nationals.

SWCC Awards: SWCC was awarded as the Best Desalination Company (2015) and Ras Al-Khair was named as the Best Desalination Plant (2015) by Global Water Intelligence in Athens, Greece.

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ACWA POWER - PRINCIPAL SPONSOR



ACWA Power is a developer, investor, co-owner and operator of a portfolio of power generation and desalinated water production plants currently with operations in 10 countries in the Middle East and North Africa, Southern Africa and South East Asia regions. ACWA Power's portfolio, with an investment value in excess of USD 26 billion, can generate 16.9 GW of power and produce 2.5 million m³ /day of desalinated water to be delivered on a bulk basis to state utilities and industrial majors on long term off-take contracts under Public-Private-Partnership, Concession and Utility Services Outsourcing models.

ACWA Power, registered and head-quartered in the Kingdom of Saudi Arabia, is owned by eight Saudi

conglomerates, Sanabil Direct Investment Company (owned by the Public Investment Fund of Saudi Arabia), the Saudi Public Pensions Agency and the International Finance Corporation (a member of the World Bank Group).

ACWA Power pursues a mission to reliably deliver electricity and desalinated water at the lowest possible cost while seeking to maximize local content and local employment creation, thereby contributing to the social and economic development of the communities and countries it invests in and serves.

ACWA Power strives to achieve success by adhering to the values of Diversity, Rigor, Ingenuity, Fairness and Integrity in operating its business.

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AECOM – SUSTAINABILITY SPONSOR



AECOM is a premier, fully integrated professional and technical services firm positioned to design, build, finance and operate infrastructure assets around the world. AECOM is ranked as the #1 engineering design firm by revenue in Engineering News-Record magazine's annual industry rankings, and has been recognized by Fortune magazine as a World's Most Admired Company. AECOM provides a blend of global reach, local knowledge, innovation and technical excellence in delivering customized and creative solutions that meet the needs of clients' projects.

For the water industry, AECOM is a global leader in the planning, design, construction and operation of water supply and treatment facilities for both municipal and industrial applications, including desalination, water reuse, and high-strength wastewater treatment. The firm partners with clients to develop creative, sustainable, practical and economical solutions to their specific challenges.

To meet growing water demands, AECOM adopts modern technologies to establish unique expertise on intake systems, pre-treatment, desalination processes, post-treatment, and concentrate management to convert impaired water sources such as highly brackish groundwater and seawater into water suited for drinking or for commercial and industrial uses.

Advancements in desalination technology and renewable energy now make converting seawater into freshwater an affordable reality. By coupling the power of sunlight and wind, AECOM can harness sustainable energy to provide new water supplies to water scarce areas.

Relevant project experience includes:

- Design and construction services for the 250 megaliters per day (ML/d) Sydney Seawater Desalination Plant, Sydney, Australia.
- Conceptual design and feasibility analysis for the 200 ML/d Carlsbad Desalination Plant; Co-located with the Encina Power Station in San Diego County, California for the Owner/Developer Poseidon Resources.

- Programme management for Trinidad and Tobago's Seawater Desalination Programme, including four desalination plants of close to 300 ML/d total capacity.
- Feasibility studies for a new 95 ML/d seawater desalination plant for Petrobras, Brazil.
- Engineering and environmental design and construction services for a desalination plant treating with variable salinity: Taunton, Massachusetts.
- Assisted the City of Long Beach, California, in the siting phase for its new sea water desalination facility that will alleviate a water shortfall.
- Lead designer to re-develop the Sarasota Desalination Treatment Facility from hollow fiber to low energy spiral wound technology.
- Kapolei Desalination Master Plan, Honolulu, Hawaii
- Performed a seawater reverse osmosis (RO) desalination pilot study for the Laguna Madre Water District at the extreme southern end of South Padre Island off the coast of Texas.
- Prepared the final design of the Cambria Desalter, a 300-gpm seawater desalter with open intake and discharge for the Cambria Community Services District.
- Prepared process design modifications that would double plant production at almost no additional energy cost for the Catalina Desalter operated by Southern California Edison at Avalon on Catalina Island.
- Provided equipment and personnel to perform a 3-month pilot evaluation of desalting San Francisco Bay water for the Marin Municipal Water District. This study was one of the first to evaluate the use of membrane filtration as pretreatment to the RO system.

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'TORAY'

Innovation by Chemistry

TORAY – WELCOME RECEPTION SPONSOR

Toray is a leading chemical manufacturer founded in 1926. Throughout its history, Toray has focused on research and development, seeking to contribute to society by creating new value.

Utilizing reverse osmosis, hollow fibre and other high-performance membrane technologies, Toray has continued to expand its reach into all sectors using membranes as solutions to water and wastewater treatment problems.

Demonstrating excellent quality and high performance, Toray's reverse osmosis element was the first to be introduced by a Japanese manufacturer. Toray also offers PVDF-based ultrafiltration/microfiltration hollow-fibre modules as well as membrane bioreactor (MBR) flat sheet membranes. The MBR flat sheet configuration offers advantages such as high water permeability and high permeate quality. Toray is the only manufacturer offering all types of membrane technologies developed internally with our own resources.



Toray continues to invest in membrane technology research and development to add to our capabilities and expand the uses of membrane technology.

Toray's operation in the US is run by Toray Membrane USA located in San Diego, the birthplace of the reverse osmosis industry. We are happy to take this opportunity to welcome all IDA delegates to San Diego.

IDE TECHNOLOGIES – NETWORKING LOUNGE AND CYBER CAFÉ SPONSOR



A world leader in water treatment, IDE specializes in the development, engineering, construction and operation of enhanced desalination, industrial water treatment and water reuse plants.

IDE leads the industry with some of the world's most advanced thermal and membrane desalination plants and has an exceptional track record in large-scale desalination with examples in China, India, US, Australia and Israel. IDE provides modular solutions that allow for growth and IDE Progreen™, a chemical-free reverse osmosis 'plant in a box'.

Also, IDE has proven experience in ground-breaking industrial water treatment plants.

Working in partnership with municipalities and industries worldwide IDE delivers some 3 million m³/day of high-quality water.

IDE listens first and then brings technological leadership, proven reliability and consistent delivery to all our customers.

ROPV – NETWORKING LOUNGE & CHARGING STATIONS SPONSOR



ROPV manufactures pressure vessels in a wide range of sizes for all major industry systems and applications. We are the largest pressure vessel manufacturer in the Asia/Pacific region with headquarters in Harbin, China, manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

Our commitment to quality and innovation has led to our successful development of original equipment configurations with various industry partners for UF, EDI, large-diameter membranes, and emerging water treatment technologies.

ROPV Performance Engineered Membrane Pressure Vessels

Committed to Quality and Technology

Visit us at en.ropv.com.cn

Email: ropv@ropv.com.cn

ABENGOA - CYBER CAFES SPONSOR

ABENGOA

Abengoa (MCE: ABG.B/P SM /NASDAQ: ABGB) is a world-leader in design, engineering, construction, and operation of desalination, water and wastewater treatment plants and hydraulic and environmental infrastructures. It has developed desalination plants with a total installed capacity of more than 3.3 million m³/d of drinking water. Abengoa also applies innovation in the energy and environment sectors including renewable power and biofuel production.

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SUEZ – INNOVATION THEATRE SPONSOR



SUEZ has built more than 255 deგრémont® desalination plants worldwide – with a total capacity of more than 3,500,000 m³/d.

SUEZ develops innovative and integrated technologies to make desalination sustainable by:

- customised design and build of brackish or seawater desalination plants of any size, modular or mobile;
- operation and services focused on day-to-day improvement and customized solutions including supply of spare parts, employee training and energy optimization;
- packaged technologies to improve pre- and post-treatment and reverse osmosis performances, or to simplify operation; and
- co-financing for a long-term partnership from design to transfer.

ACCIONA – MOBILE APP SPONSOR



ACCIONA Agua provides tailor-made water solutions that contribute to sustainable development in the water sector through cutting-edge innovation in whole water cycle. We are one of the world's leading companies in reverse osmosis desalination and water and wastewater treatment with more than 40 years of experience that have turned us into experts in the process that takes water to every home and back to nature again.

We have more than 75 reference plants which include:

- Adelaide (Australia) seawater reverse osmosis -300,000 m³/d;
- Tampa (Florida) seawater reverse osmosis - 108.800 m³/d;
- Atotonilco WWTP (Mexico) – 50 m³/s; and
- Gabal Al Asfar WWTP (Egypt) 500,000 m³/d



DOW WATER & PROCESS SOLUTIONS – CLOSING RECEPTION SPONSOR

Dow Water & Process Solutions is launching its next generation industrial and municipal ultrafiltration water treatment modules in the USA at IDA World Congress. The IntegraFlux™ Ultrafiltration Modules feature XP Fiber: a high-performance, breakthrough fiber that delivers high-quality water at a lower cost. With up to 35% higher permeability than previous generation ultrafiltration fiber, XP fiber provides higher flux, higher water recovery, lower waste, and reduced energy use – providing industry-leading productivity with a small footprint.

For more information visit
www.dowwaterandprocess.com.

VEOLIA WATER - CONGRESS INFORMATIONAL KIOSKS SPONSOR



With more than 100 years of experience in desalination, Veolia is a world leader in assisting municipalities and industries implement desalination strategies. Veolia specializes in seawater or brackish water desalination plants and units of all sizes, utilizing four types of solution: multi-stage flash distillation, multiple effect distillation (MED), reverse osmosis (RO) and hybrid desalination, coupling MED and RO. Veolia produces more than 12.9 million m³ of desalinated water daily.

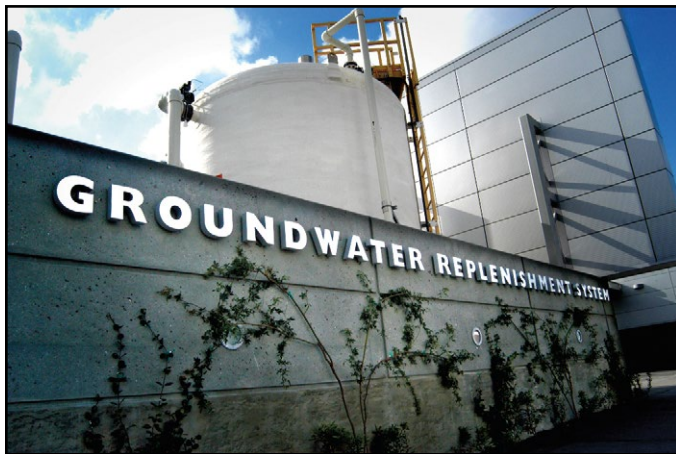
AGRU - CORPORATE SPONSOR



Booth 710 IDA World Congress 2015

Agru America supplies large diameter piping systems and other innovative solutions for desalination applications including concrete protective liners and NSF 61-approved waterproofing products. Agru America is part of Alois Gruber GmbH, an Austrian family-owned business since 1948 with production facilities in Austria, the U.S., Germany, China and India, and distribution in over 80 countries worldwide.

Facility Tours: Orange County Groundwater Replenishment System and Carlsbad Desalination Project



Reservations for the facility tours to visit the Orange County Groundwater Replenishment System and Carlsbad Desalination Project – two of the highest profile projects in the US – are now sold out. Please check at the Registration Counter at the venue to be wait listed.

The first tour, a full day event, visits both the Orange County Groundwater Replenishment System and the Carlsbad Desalination Project. Two additional tours will visit the Carlsbad Desalination Project only; these run from 8 a.m.-10 a.m. Delegates should be aware that return arrival time is approximated and will depend on traffic.

The Carlsbad Project

The largest seawater desalination project in the Western Hemisphere, the Carlsbad Desalination Project is more than 80 percent complete and on schedule for delivering drought-proof water supplies to the San Diego County Water Authority by fall 2015.

The project will deliver up to 50 million gallons a day of clean, fresh and highly reliable water that will become a core, day-to-day resource for the region. It is projected to meet 7 percent of San Diego County's demand in 2020. In addition, the reverse osmosis plant will make the region's water supplies more reliable by reducing dependence on imported water from the Los Angeles-based Metropolitan Water District of Southern California that is vulnerable to droughts, natural disasters and regulatory restrictions.

The Carlsbad Desalination Project is an important element of the Water Authority's long-term strategy to improve the San Diego region's water supply reliability. It includes securing independent water transfers from the Colorado River, increasing regional water-use efficiency and developing local sources such as groundwater, surface water and recycled water. Completion of the Carlsbad project will put the Water Authority on pace for meeting its diversification goals for 2020.

Orange County Groundwater Replenishment System (GWRS)

The world's largest water purification system for potable reuse takes highly treated wastewater that would have previously been discharged into the Pacific Ocean and purifies it using a three-step advanced treatment process consisting of micro-filtration, reverse osmosis and ultraviolet light with hydrogen peroxide. The process produces high-quality water that meets or exceeds all state and federal drinking water standards.

Operational since January 2008, this state-of-the-art water purification project can produce up to 70 million gallons (265,000 cubic meters) of high-quality water every day. This is enough water to meet

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the needs of nearly 600,000 residents in north and central Orange County, California.

The design and construction of the GWRS was a project jointly-funded by the Orange County Water District and the Orange County Sanitation District. These two public agencies have worked together for more than 30 years. They are leading the way in water recycling and providing a locally-controlled, drought-proof and reliable supply of high-quality water in an environmentally sensitive and economical manner.

After wastewater is treated at the Orange County Sanitation District, it flows to the GWRS where it undergoes a state-of-the-art purification process consisting of microfiltration, reverse osmosis, and ultraviolet light with hydrogen peroxide. The product water is near the purity of distilled water.

Approximately 35 million gallons (132,500 cubic meters) per day of the GWRS water are pumped into injection wells to create a seawater intrusion barrier. Another 35 million gallons (132,500 cubic meters) are pumped daily to Orange County Water District's percolation basins in Anaheim where the GWRS water naturally filters through sand districts and gravel to the deep aquifers of the groundwater basin.

The GWRS is currently undergoing a 30-MGD expansion that was slated to be completed in June 2015. It will take the total water production to 100 MGD, or enough water for 850,000 people.

Since its inception, the GWRS has produced more than 150 billion gallons of water that has helped replenish and protect Orange County's groundwater basin. This internationally renowned facility has garnered nearly 40 awards including the

prestigious 2008 Stockholm Industry Water Award for the year's most outstanding international water project and serves as a global model for water reuse professionals.

The IDA facility tours are complimentary for Congress delegates but are limited in space. Passports or drivers licenses are required for security purposes. Attendees should be safety-prepared by wearing long pants and covered shoes. Those interested in tours must pre-register on line.

World Congress Co-Located Events Add Exciting Dimension to San Diego

Attendees at IDA World Congress will have added opportunities to learn at three co-located events: DesalTech 2015, AMTA's Pre-Congress Workshop and IDA Academy Courses.

DesalTech 2015 is a two-day conference that takes place on August 28-29. Research presentations at DesalTech will focus on emerging water desalination technologies for municipal and industrial applications.

Highlights from the conference program include:

- Two plenary sessions featuring distinguished experts from Singapore Membrane Technology Center, Yale University, National University of Singapore and Conoco-Philips
- Twelve topic sessions featuring 50 presentations on emerging research in forward osmosis, membrane distillation, pressure retarded osmosis, reverse electrodialysis, and other desalination technologies
- Welcome/networking reception highlighting 30 technical poster presentations

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The DesalTech2015 Conference will focus specifically on research

in emerging water desalination technologies for municipal and industrial applications. While reverse osmosis (RO) has become the conventional seawater and brackish water desalination technology in both municipal and industrial water applications, global research and development is focusing on several emerging technologies that enhance energy efficiency and offer further opportunities for integration with renewable energy. These processes include forward osmosis (FO), membrane distillation (MD), adsorption desalination (AD), and capacitive deionization (CDI). In addition to water production, there is a growing interest in exploiting desalination brines for (salinity gradient) energy production through processes like pressure retarded osmosis (PRO) and reverse electrodialysis (RED).



American Membrane Technology Association (AMTA) Pre-Congress Workshop:

"Pioneering Achievements in Desalination with a Review of Current Status" will be held on Sunday, August 30 and feature a morning session devoted to four talks by individuals who have been featured in AMTA's "Chats with the Pioneers." The topics include the early history of desalination in the Caribbean, the development of membrane technologies, and the development of efficient energy recovery devices. The afternoon session addresses the current and future status of seawater desalination in Florida and California, and sessions on pre and post treatment for seawater RO applications on both coasts.

IDA Desalination Academy Courses

Water & Wastewater Minimization Using Current & Emerging Membrane Technologies with Mr. David Paul, President, David H. Paul, Inc., will be held on Sunday, August 30 from 8:30 a.m.-4:30 p.m.

This seminar will be presented before the World Congress to provide attendees with a thorough understanding of most of the technologies for which papers will be presented. The information is also practical and immediately usable for knowing options for reducing raw water usage and reducing wastewater discharge at water treatment facilities.

The training will be provided in a step-by-step, easy-to-understand manner. The multimedia presentation will quickly provide, in an enjoyable learning experience, how each of the following technologies work and can be used for water and wastewater minimization: BWRO, SWRO, FO, ED, EDR, CCD™, HERO™, MCDI, MD and Membrane Filtration (both polymeric and ceramic).

A Comparison of Manufacturers' Technology for Membrane Filtration used in Water & Wastewater Treatment with Dr. Graeme K. Pearce, Director of Membrane Consultancy Associates (MCA) will be held on Friday, September 4 from 8:30 a.m.-12:00 p.m.

This morning workshop is designed for students with a range of experience in membranes and water. It is suitable for both those who are relatively new to the field and those who are experienced membrane technologists.

The workshop will draw a comparison of commercial membrane filtration technology for water

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and wastewater treatment. It offers an evaluation of commercially available technology, reviewing current status, recent developments and the outlook for UF and MF technologies. The comparison will look at pros and cons of the technologies in a range of applications including surface water, desalination pre-treatment and wastewater reuse.



Education Day Welcomes Over 400 Students

The IDA World Congress proudly welcomes over 400 students at its first Education Day. Held in the Exhibition Hall, the program is designed to inform middle school students about desalination and water reuse with engaging talks and demonstrations. It will also include a guided walk through the Exhibit Hall.

Middle school students from the La Mesa Spring Valley and Cajon Valley Union School Districts will view a short film in the Innovation Theater followed by a ten-minute talk about water reuse and desalination, presented by Lisa Henthorne and Dr. Jim Birkett.

Ms. Henthorne has over 25 years of extensive experience in the field of membranes and desalination in seawater, brackish water and wastewater reclamation applications. A Past President of IDA, she is Chief Technology Officer at Water Standard, where she is responsible for directing and developing the technology and design aspects of vessel-based desalination solutions. Earlier in her

career, she served as a Vice President of CH2M HILL, a \$6 billion global engineering and construction business, and was their Global Director of Desalination from 2004 to 2008. Over the course of her career, she has led and served as technical advisor on some of the world's largest desalination projects. She has also worked for the U.S. Bureau of Reclamation, the U.S. State Department and Aqua Resources International, a consulting firm specializing in desalination technology.

Widely considered one of the desalination industry's most respected professionals, Dr. Birkett, a recipient of IDA's Lifetime Achievement Award, has more than four decades of experience in the study of desalination, advanced water treatment, and membrane separation industries and technologies. He was the first elected President of IDA. He later served as Treasurer and was a Director for many years. From 2009-2013, he served as Chairman of the Editorial Boards for the IDA Journal of Desalination and Water Reuse. He has also served on the editorial boards of numerous other desalination publications and was a Contributing Editor to the Encyclopedia of Desalination and Water Resources. He continues to consult, lecture and publish widely in his fields of interest. He is a graduate of Bowdoin College, where he earned his BA, and Yale University, from which he received his MS and PhD degrees in physical chemistry.

Members of the IDA Young Leaders Program will also assist in escorting student groups through the exhibit hall. Along with water-related exhibits, students will enjoy a "brain race."

"We are excited to be hosting the next generation of young leaders in the water reuse and desalination industry," says Patricia Burke, IDA Secretary General.

2015 IDA World Congress Event Highlights

World Congress Week at a Glance

Here's a look at the World Congress week highlights.

		 		AUG 30-SEPT 4, 2015 SAN DIEGO CONVENTION CENTER SAN DIEGO, CALIFORNIA, USA				
CONGRESS GENERAL SCHEDULE AND TECHNICAL SESSIONS								
	TIME	Sunday 30-Aug-15	Monday 31-Aug-15	Tuesday 1-Sep-15	Wednesday 2-Sep-15	Thursday 3-Sep-15	Friday 4-Sep-15	
Exhibition Move-in Thursday, August 27th through Sunday, August 30th	7.30-8.30	 IDA DESALINATION ACADEMY COURSE 8 - 6  WORKSHOP 8:30 - 4:30	Co-Chairs & Presenters of the Day: Breakfast Mtg		Co-Chairs & Presenters of the Day: Breakfast Mtg		Co-Chairs & Presenters of the Day: Breakfast Mtg	
	9.00-9.30		Opening Ceremony BALLROOM Ribbon Cutting and Official Opening of Exhibition		REFRESHMENT BREAK (10.30-11a)		REFRESHMENT BREAK (10.30-11a)	
Pre-Congress DesalTech2015 CONFERENCE DATES: Friday & Saturday, August 28-29, 2015 Registration 8-9am Program Runs 9am - 5:30pm (each day)	10.30-11.00	IDA DESALINATION ACADEMY COURSE 8 - 6  WORKSHOP 8:30 - 4:30	REFRESHMENT BREAK (10.30-11a)		REFRESHMENT BREAK (10.30-11a)		REFRESHMENT BREAK (10.30-11a)	
	11.00-11.30		LUNCH BREAK (12.30 - 2.00)		LUNCH BREAK (12.30 - 2.00)		IDA MEMBERSHIP MEETINGS 1:30-2	
11.30-12.00	12.00-12.30	PRE-REGISTRATION OPEN 2-6pm IDA Incoming Board of Directors mtg (T-17) 3:30pm WELCOME RECEPTION 6pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)	
12.30-14.00	12.30-2.00		IDA Outgoing Board of Directors mtg (T-16) 1-3pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
14.00-14.30	2.00-2.30	IDA Outgoing Board of Directors mtg (T-16) 1-3pm		REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
14.30-15.00	2.30-3.00		IDA Outgoing Board of Directors mtg (T-16) 1-3pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
15.00-15.30	3.00-3.30	IDA Outgoing Board of Directors mtg (T-16) 1-3pm		REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
15.30-16.00	3.30-4.00		IDA Outgoing Board of Directors mtg (T-16) 1-3pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
16.00-16.30	4.00-4.30	IDA Outgoing Board of Directors mtg (T-16) 1-3pm		REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
16.30-17.00	4.30-5.00		IDA Outgoing Board of Directors mtg (T-16) 1-3pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
17.00-17.30	5.00-5.30	IDA Outgoing Board of Directors mtg (T-16) 1-3pm		REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
17.30-18.00	5.30-6.00		IDA Outgoing Board of Directors mtg (T-16) 1-3pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
18.00-22.00	6.00-10.00	IDA Outgoing Board of Directors mtg (T-16) 1-3pm		REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)
			IDA Outgoing Board of Directors mtg (T-16) 1-3pm	REFRESHMENT BREAK (3.30-4p)		REFRESHMENT BREAK (3.30-4.15p)		REFRESHMENT BREAK (3.30-4p)

The IDA World Congress 2015 Technical Program Sessions and General Schedule is current as of 23 JULY 2015 and is subject to change

Young Leaders to Host Event at World Congress

Current and prospective members of IDA's Young Leaders Program (YLP) are invited to a networking event at the San Diego Marriott Marquis & Marina on the Terrace. The event takes place on Wednesday, September 2, from 7:00-9:00 p.m., with informal remarks to welcome guests.

The IDA YLP is open free of charge to all IDA members 35 years of age or younger.

[More information.](#)

Inspiring Tomorrow's Water Leaders Today



2015 IDA World Congress

Event Highlights

Advance Program Now Available

The Advance Program is filled with updates and the latest information about the World Congress including easy to access information about the Technical Program oral and digital poster presentations, panel discussions and much more. It can be downloaded from the [World Congress website](#).

Highlights of the World Congress Exhibition

The Exhibition is traditionally one of the most popular and well-attended aspect of the World Congress. This year, the 11,000 square meter Exhibition will feature more than 90 companies from around the world, each presenting their latest technologies, solutions and services for the desalination and water reuse industry.

IDA's booth is always a popular gathering spot, and it will feature ample locations to meet and mingle with colleagues, renew or sign up for IDA membership or learn more about IDA's Affiliates. The Innovation Theater provides a new venue for learning about new technologies and services, with presentations scheduled for Monday afternoon, all day Tuesday, and Thursday morning.

The Exhibition area also boasts two networking lounges, where attendees can relax and make new connections, as well as refreshment areas where you can have morning coffee or quench your thirst during the afternoon break.

You can also visit a dedicated media resource center located in the Registration Lobby, just outside the Exhibition to pick up a copy of

several industry magazines from the World Congress Media Partners and read the latest news and views.

This year, IDA will offer a day-pass for the Exhibition for those individuals who want to visit only that part of the World Congress, at a cost of \$100 US per day. Online registration is recommended – please see the registration page on the [World Congress website](#).

Thanks to the Technical Program Committee and Session Co-Chairs

IDA wishes to extend a sincere thank you to World Congress Technical Program Co-chairs, Mr. Douglas Eisberg and Dr. Richard Stover, two highly respected authorities in desalination and reuse who currently serve on the IDA Board of Directors. Both Doug and Rick have worked tirelessly to put forth the largest and most comprehensive Technical Program ever.

In addition, we want to thank the members of the Technical Program Committee...

- Dr. Hany Al-Ansary, Saudi Arabia
- Mr. Fahad Almuhaizie, Saudi Arabia
- Mr. Borja Blanco, Spain
- Mr. Gary Crisp, USA
- Dr. Nobuya Fujiwara, Japan
- Mr. Ben Movahed, USA
- Mr. Tom Pankratz, USA
- Mr. Kevin Price, USA

Advisory Committee Members

- Mr. Leon Awerbuch, USA
- Dr. Emilio Gabbrielli, Brazil

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2015 IDA World Congress

Event Highlights

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- IDA Secretary General, Ms. Patricia Burke
- IDA Technical Program Manager, Ms. Darlene Seta

... and Technical Program Session Co-Chairs for their generous contribution of time and effort.

S-01 Brackish Water Desalination: Concentrate Management and Zero Liquid. Co-chairs: Mr. Kevin Price, USA, Mr. Marc Fabig, Australia, Mr. Santi Talo, Spain

S-02 Brackish Water Desalination: Fouling and Scaling. Co-chairs: Mr. Steve Chesters, UK, Dr. Prof. Mahmoud Abdel-Jawad, Kuwait

S-03 Brackish Water Desalination: High Recovery and Variable Salinity. Co-chairs: Mr. James C. Lozier, USA, Mr. Jorge Malfeito-Sanchez, Spain, Mr. Ali Kalantar, USA

S-04 Emerging Technologies: Advanced Membrane Technologies. Co-chairs: Mr. Saied Delagah, USA, Mr. Francisco Bernaola Echevarria, Spain; Mr. Victor Verbeek, Australia

S-05 Emerging Technologies: Forward Osmosis and Osmotic Processes [Part 1]. Co-chairs: Mr. Peter G. Nicoll, UK, Dr. Joon Ha Kim, Korea, Ms. Yuliana Porras-Mendoza, USA

S-06 Emerging Technologies: Forward Osmosis and Osmotic Processes [Part 2]. Co-chairs: Dr. Anthony Fane, Singapore, Dr. Graeme Pearce, UK, Mr. Hidehiko Sakurai, Japan

S-07 Emerging Technologies: Innovations in Desalination Systems. Co-chairs: Mr. Guillermo Zaragoza, Spain, Dr. Hany Al-Ansary, KSA, Ms. Veronique Bonnelye, France

S-08 Emerging Technologies: Research and Development. Co-chairs: Mr. Domingo Zarzo, Spain, Dr. Lucy Camacho, USA, Dr. Maria D. Kennedy, Netherlands

S-09 Environment and Sustainability. Co-chairs: Prof. Alexei Pervov, Russia, Mrs. Sophie Bertrand, France, Mrs. Ursula Annunziata, UK

S-10 Governance, Finance and Project Delivery. Co-chairs: Dr. Mohamed Osman Saeed, KSA, Mr. Eric Jankel, USA

S-11 Industrial Water and Wastewater Treatment and Reuse [Part 1]. Co-chairs: Mr. Erik Tynes, Canada; Mr. Devesh Sharma, USA; Mr. Rhett Butler, Australia

S-12 Industrial Water and Wastewater Treatment and Reuse [Part 2]. Co-chairs: Mr. Greg Wetterau, USA, Mr. James F. DeCarolis, Jr., USA, Mr. Rod Posada, USA

S-13 Plant Operations and Optimization [Part 1]. Co-chairs: Mr. Rodney Clemente, USA, Ms. Lisa Henthorne, USA

S-14 Plant Operations and Optimization [Part 2]. Co-chairs: Mr. Ben Movahed, USA, Engr. Othman Y. Al-Najdi, KSA, Mr. Troy Walker, USA

S-15 Plant Operations and Optimization [Part 3]. Co-chairs: Ms. Jantje Johnson, USA, Dr. Boris Liberman, Israel; Dr. Srinivas (Vasu) Veerapaneni, USA

S-16 Potable Water Reuse and Public Outreach. Co-chairs: Mr. Mehul V. Patel, USA, Mr. Harry Seah, Singapore, Mr. Kevin Alexander, USA

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S-17 Pre- and Post-treatment [Part 1]. Co-chairs: Mr. Ian Watson, USA, Prof. In S. Kim, Korea

S-18 Pre- and Post-treatment [Part 2]. Co-chairs: Dr. Nobuya Fujiwara, Japan, Mr. Ramashankar Jagwani, UAE

S-19 Seawater Desalination: Energy Efficiency and Recovery [Part 1]. Co-chairs: Mr. Shawn Meyer-Steele, USA, Mr. Gary Crisp, USA, Mr. Robert Huehmer, USA

S-20 Seawater Desalination: Energy Efficiency and Recovery [Part 2]. Co-chairs: Dr. William Andrews, Bermuda, Mr. Borja Blanco, Spain, Mr. Neil Hawkins, Cayman Islands

S-21 Seawater Desalination: Fouling and Scaling. Co-chairs: Prof. Dr. Harvey Winters, USA, Mr. Eduard Gasia Bruch, Spain, Ms. Lynne M. Gulizia, USA

S-22 Seawater Desalination: Intakes, Outfalls, Materials, Corrosion. Co-chairs: Mr. Paul Findley, USA, Dr. Abdelkader Meroufel, KSA, Dr. Glenn Byrne, UK

S-23 Thermal Desalination and Power Hybrids. Co-chairs: Prof. Ibrahim S. Al-Mutaz, KSA, Mr. Fahad Almuhaizie, KSA, Ms. Chiara Fabbri, UAE

S-24 Thermal Desalination: Membrane Distillation. Co-chairs: Dr. Noreddine Ghaffour, KSA, Dr. Ibrahim Al-Tisan, KSA, Dr. Heike Glade, Germany

Details of each session are available in the Advance Program or on the [World Congress website](#). The 164 poster presentations can be viewed in the Ballroom 6 Lobby in the Technical Program (upper level of the Convention Center), where IDA has stationed about a dozen monitors for easy access.

These poster presentations provide an opportunity for Congress delegates to become acquainted with special projects, scientific research or study analyses quickly and easily.

A digital poster is an oral presentation, in an alternative setting. This format allows for much broader viewing possibilities, providing a unique way of presenting scientific research. In addition, the electronic poster display will provide the advantage of personal, one-on-one interaction for the duration of the Congress. This allows for an enhanced networking environment and encourages delegates and authors to converse directly and freely. Authors also have the option to allocate specific times with the delegates during the Congress to present their digital poster(s), or to have impromptu talks.

2015 IDA World Congress

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IDA Welcomes World Congress Media Partners

IDA is pleased to welcome its Media Partners for the World Congress.



Desalination & Water Reuse, lead media partner and publisher of D&WR Magazine, IDA's official member magazine



EVERYTHING ABOUT WATER
EverythingAboutWater



FuturEnviro



Global Water Intelligence



Industrial Hygiene News



Infrastructure Middle East



Pollution Equipment News



Produced Water Society



Pumps & Systems, Pumps & Systems MENA and Upstream Pumping, published by **Cahaba Media**



The Water Network



WaterBiz

WATER DESALINATION REPORT

Water Desalination Report



PennWell – **Water World** and Waste Water International, producers of the **Desalinate Newscast** supported by IDA

Cutting-Edge Water Treatment Technologies

2015 APDA & JDA Joint Forum



Earlier this year, the Asia Pacific Desalination Association (APDA) and the Japan Desalination Association (JDA) held the 2015 APDA & JDA Joint Forum at the Tokyo Big Sight Conference Tower. The Theme of the Forum was “Cutting Edge Water Treatment Study ‘Desalination & Water Reuse’ for Municipal and Industry Water.” Nearly 80 people joined the forum and actively exchanged their opinions and discussed new technologies such as Pressure Retarded Osmosis (PRO).



Four keynote lectures and six research works were presented at the Forum. The first two keynote speeches were related to the national projects in Japan and Korea. Dr. Masaru Kurihara, Fellow of Toray Industries, Inc. presented the results of the Mega-ton Water System Project, and Prof. Seung-Hyun Kim, Kyungnam University, Director of Global MVP Research Consortium, reported on the newly started Global MVP (MD, VRR & PRO) Research in Korea

Dr. Kurihara outlined the Mega-ton Water System that is the state supported project to

develop mega-scale (1,000,000 m³/d) seawater desalination plant system technologies. The Mega-ton Water System’s mission is to develop innovative desalination technology to meet energy reduction, low environmental impact and low water production cost. Through the project, many new technologies were developed with features such as 20-30% less energy used in operations, bio-friendly operating methods such as no chemical additives, and reduction of water production cost.

Prof. Kim reported the newly started Global MVP (MD [Membrane Distillation], VRR [Valuable Resource Recovery], PRO [Pressure Retarded Osmosis]), which is funded by MoLIT/KAIA and composed of many academic and research institutes and industry members. The MD team’s target is changing SWRO concentrate to fresh water using vapor pressure differences between two solutions. The VRR team’s target is to recover valuable resources like lithium from the SWRO concentrate. The PRO team’s target is enhancement of efficiency (generating electricity using PRO technology).

Following two keynotes, Mr. Takeshi Shinoda, Secretary General, Global Water Recycling and Reuse Solution Technology Research Association (Japan) reported on the METI (NEDO) project “Integrated Membrane System Project Utilizing Seawater Desalination and Wastewater Reclamation Technologies.” The integrated seawater desalination and sewage reuse system demo tests were conducted in the Water Plaza, which is located in Kita-Kyusyu City and Shunan City. Sewage concentrate generated from the hybrid MBR and RO process is mixed in seawater, and it is used as a SWRO feed water to reduce operating

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Cutting-Edge Water Treatment Technologies

2015 APDA & JDA Joint Forum

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pressure. The water production cost using this system achieved around 30% reduction, and this system has successfully operated during approx. 3 years using a special biocide. During the past five years, 5,600 visitors from home and abroad came to the Water Plaza in Kita-Kyushu, where they were introduced to the excellent water treatment technology of Japan.

Dr. Michio Murakami, Fukushima Medical University, on behalf of Prof. Taikan Oki, made the last keynote speech entitled "A Tracer Simulator of Fallout Radionuclides for Safe and Sustainable Water Use." This study investigated radionuclides exposure from dietary intakes at the Fukushima accident, radionuclides transport through air and deposition, and radionuclides wash-out behavior and its model. Estimation of exposure quantity showed a good match with actual surveys. Simulation by Iso RSM (Isotope-incorporated Regional Spectral Model) showed atmospheric transport. In observation of the Teganuma Basin, cesium (Cs) concentration gradually decreased and became constant, and Cs concentration at wet weather was high. The cooling of the reactors during containment work with seawater and fresh water and the discharge from the damaged buildings resulted in direct release of high radioactive liquid wastes to the ocean, but it is now very limited.

The following are summaries of the six presenters at the workshop:

Energy Recovery by PRO Systems JDA/ Megaton Project/ PRO System

Mr. Hideyuki Sakai, President of Kyowakiden Industry CO., Ltd.

A PRO technology recovers renewable energy. Features of PRO are no heat emission, no chemical reaction, stability under any weather condition, and the PRO system uses treated wastewater, so it can be constructed near or in urban areas. The PRO prototype plant has operated successfully over one year and achieved 10 W/m² power density. The generation cost of a designed 100 kW PRO commercial plant is 32.8 JPY/kWh. It is anticipated to be one of key technologies in future mega-ton water systems.

Mega-ton Project / Microbial Processes in SWRO Systems

Prof. Kazuhiro Kogure, University of Tokyo

The application of chemical treatment to membrane desalination plant is believed an effective way to prevent bio-fouling. However, comparative work on chemical and non-chemical treated systems shows the opposite result. This study showed that conventional cell count techniques (plate counts) underestimate the actual biomass and overlook major microbiological processes. Further, the addition of chemicals (chlorine and sodium bi-sulfite) caused only a marginal decrease in the cell numbers but markedly affected the microbial community structures. Therefore, chemical treatment is not an effective way to suppress biofouling in SWRO system.

Desalt & Reuse Water by Advanced Membrane Technologies

Dr. RUAN Guoling, Chief Engineer of ISDMU

Membrane separation is a core technology of separation, and widely used in water treatment, energy, environment improvement and update of traditional industries. Membrane desalination and

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Cutting-Edge Water Treatment Technologies

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reuse is practiced in China drinking water treatment by MF/UF, sea- and brackish water desalination, integrated technologies to realize zero liquid discharge (ZLD), and so on. Better membranes, large capacity plants, new ZLD methods, use of recyclable materials, inorganic membranes, etc. should be developed in the future.

Bio-stability Evaluation and Control: a Different Story of Wastewater Reclamation and Reuse

Prof. Hu Hong-Ying, Tsinghua University

Wastewater reclamation and reuse are important because of global water shortages. However, water reclamation has water quality risks, such as bacterial re-growth, etc. Biological stability evaluation is needed to confirm the biological risk. Assimilable Organic Carbon (AOC) analysis is better way to evaluate reclaimed water biological stability. Studies using AOC analysis show that the decrease of large molecular weight (MW) fractions affects bacterial growth. Therefore, conventional processes that decrease large MW fraction should be re-evaluated for reuse, and a quality standard of AOC analysis for reclaimed water use is needed.



Development of New, Improved Membranes and Membrane-Based Systems in Singapore

Assistant Prof. Chew Jia Wei, SMTC

This presentation introduced trends in Singapore's latest water treatment technologies. Water desalination using membranes is a key technology in Singapore. Singapore must have a self-sufficient water supply in 2060 because the second of its two water agreements with Malaysia will expire in 2061. For this reason, the Singapore Membrane Technology Center (SMTC) was established. The objective of SMTC is to enhance the performance of membranes and processes in the water industry. SMTC has developed many kinds of membranes that have high performance, fouling control and sensors, and hybrid desalination methods achieve less energy consumption and waste, and improved water quality.

FO-RO Hybrid Desalination Project: An Ambitious First Step toward Low Energy and Low Fouling Desalination

Prof. SOHN Jinsik, Kookmin University.

The desalination market has seen rapid and sustainable growth. It is also highly competitive and seeks to lower energy requirements. Forward Osmosis (FO) is a key technology to meet these demands. FO - Reverse Osmosis (RO) hybrid system concepts offer benefits in low energy consumption and fouling reduction. The FO-RO Hybrid desalination project consists of four core elements: management, unit process, engineering and pretreatment. It also contains many new systems and technologies. Finally the technologies used in these projects will be integrated and demonstrate in a FO-RO demonstration plant.

Calendar of Events

August 30 – September 4, 2015

IDA 2015 World Congress

San Diego, CA USA

November 18–21, 2015

IDW 2015

Jeju, Korea

February 1–4, 2016

**AWWA/AMTA 2015 Membrane
Technology Conference &
Exposition**

San Antonio, Texas, USA

May 22–26, 2016

**Desalination for the Environment,
Clean Water and Energy**

Rome, Italy

May 31 – June 3, 2016

**CaribDA 2016 Biennial
Conference & Exposition**

Trinidad

September 26–27, 2016

IDA Water Reuse Conference

Nice, France

November 6–9, 2016

**Membranes in Drinking and
Industrial Water Production**

Leeuwarden, The Netherlands

May 6–10, 2018

**Desalination for the Environment,
Clean Water and Energy**

Nantes, France



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