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Winter 2017

Director's Message

Greetings ISA Chemical and Petroleum Industries Division Members:



We have closed another productive year. The first order of business in this communication is to celebrate and congratulate the Chemical and Petroleum Division Board and Membership for being recognized with a mention as the Most Improved Division at the 2016 ISA Fall Leaders Meeting. This is an acknowledgement that the contributions of ChemPID (—that's you!) are being noticed and are valued. Your technical contributions to symposia, standards committees, webinars, and division newsletters are fundamental to fulfilling the mission of ISA. Thank you for letting your voice be heard.

In addition to the exposure to in-depth technical knowledge that ISA membership provides, ISA is committed to developing leaders that will keep the society and the automation industry strong. In 2016, the ISA Executive Board assembled experienced ISA leaders on special task forces focused on leader development. These task forces have refined the process for identification of the next generation of industry leaders, and identified processes for providing training and mentorship. Several components of the processes are currently being rolled-out, including a portal for receiving potential leaders at facestowatch@isa.org. Nominate some of the great professionals in your personal network by submitting their names to this portal.

I also want to note the exceptional work ChemPID Symposium Chairs Nick Sands and Fares Karadsheh completed in developing the ChemPID track for the Process Control and Safety Symposium and Exhibition in Houston, Texas, 7–10 November 2016. The event attracted over 300 attendees.

In 2017, the ChemPID Board has planned another year of programmed opportunities for us to grow together, including our 2017 E-Week Challenge, a division membership drive, technical scholarships, mentorship, and social events. Be sure to enjoy the full benefits of your membership, by getting engaged in division activities.

- Submit an article or paper to be published in the newsletter to ISA.ChemPID@gmail.com
- Join the discussion on the LinkedIn ISA Chemical & Petroleum Division group
- Present your work at ISA events and conferences
- Recommend a student for a ChemPID ISA Technical Division Scholarship
- Serve as a volunteer/sponsor for E-Week activities

You will find the details of these events, and many other events in this publication, as well as on our Chemical and Petroleum Division webpage, www.isa.org/chempid.

Best Regards,
Rhonda Pelton
ISA ChemPID Division Director

Board Members



Director:
Rhonda Pelton
*Process Automation
Manager
The Dow Chemical
Company*



**Education & Symposium
Chair:**
Fares Karadsheh
*Account Manager/
Project Development
Process Solutions*



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*Automation Systems
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*Manufacturing
Technology Fellow
DuPont*



**Secretary-
Treasurer:**
Rolanda Reed
*Senior Process
Controls Engineer
Maverick Technologies*



**Membership
Chair:**
Ashley Weckwerth
*Instrumentation and
Controls Department
Burns & McDonnell
(Kansas City)*

ChemPID Announcements

Upcoming ChemPID Webinar

Implementation of Procedural Control in the Chemical Industry
Tuesday, March 7th, 2017 at 10am CST
Free Webinar
Presented by: Yahya Nazer, Chair of the ISA106 Committee
Visit: www.isa.org/ChemPID for details or to register.

ISA launches SCADA Systems Standard Committee

Research Triangle Park, North Carolina, USA (01 August 2016) — ISA's Standards & Practices (S&P) Board has approved a new committee to be designated ISA112, SCADA Systems. This approval follows widespread support for the idea from a survey conducted via ISA's *InTech* magazine and online media.

ISA112 will develop standards and technical reports intended to improve the overall reliability of supervisory control and data acquisition (SCADA) system design, installation, integration and operation of the infrastructure for pipelines, water and wastewater, power, oil and gas, and other industries. The standards and technical reports will provide guidance for implementing effective and reliable SCADA systems by documenting best practices in a range of industries.

S&P Board member, Greg Lehmann, will serve as ISA112 managing director and oversee the startup of the new committee by drawing on his experience as founding co-chair of ISA101, Human-Machine Interface. Lehmann is Process Automation Technical Manager, Engineering and O&M, Oil & Gas, at AECOM.

For more information, visit <https://www.isa.org/templates/news-detail.aspx?id=147643>

ChemPID-ISA Community Involvement

ChemPID Division Award at Fall Leaders Meeting, 2016

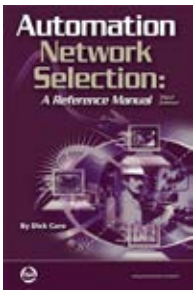


Rhonda Pelton reviews ChemPID upcoming events at the FLM Industries and Sciences Awards Luncheon.



Prabhu Soundarajan presents the award for Outstanding Division—Honorable Mention to ChemPID Luncheon.

Recommended Reading Material



Automation Network Selection: A Reference Manual by Dick Caro

Are you trying to make sense of all the different industrial automation networks on the market today? Whether you're a novice industrial network user or someone who simply needs to brush up on the technology, Automation Network Selection will help you better understand and select the "right" network for a given application.

For more information/details, visit: www.isa.org/networkselect

ISA Calendar of Events

62nd ISA Analysis Division (AD) Symposium

Sunday, 23 April – Thursday, 27 April 2017
Pasadena Convention Center, Pasadena, CA

ISA Spring Leaders Meeting

Saturday, 6 May – Monday, 8 May, 2017
Marriott Raleigh Crabtree Valley, Raleigh, NC

17th ISA LDAR Fugitive Emissions Symposium

Tuesday, 20 June – Wednesday, 21 June 2017
The Tremont House/Wyndham Grand Hotel, Galveston, TX

ChemPID-Members Contribution

Recently Neelesh Shah's article on "Maintaining Stable Gas Pressure for Hydrochloric Acid Production and Preventing Safety/Environmental Incidents," was selected as a poster presentation in OACETT (Ontario Association of Certified Engineering Technician and Technologist) 2016 AGM and Conference, in Hamilton Canada. During the conference, Mr. Shah interacted with Hon. Kevin Flynn, Minister of Labor, On, Canada along with other OACETT and industry leaders. He explained "how one can mitigate industry process safety risks by applying sound automation/instrumentation engineering design."



Developing a Model-Based Culture: Optimizing Chemical Production

By Terumi Okano, Product Engineering, AspenTech
Published on Automation.com, 9 May 2016

Chemicals are the cornerstone of everyday life. In a world witnessing increasing industrialization and urbanization, the demand for products is creating an increasingly competitive landscape. Against a backdrop of market volatility and stringent governmental regulations, chemical companies must adapt to both regional and global competition through the downstream value chain. This requires operational efficiencies, streamlined processes and appropriate skills to get the most value from the operation and to meet customer demand.

To remain profitable, many bulk chemical companies are focused on implementing operational efficiency measures, such as reducing energy and driving maximum throughput of plant assets. Those businesses which adopt a model-based approach to manufacturing, utilizing cutting-edge technology, have the flexibility to address operational issues and achieve the most immediate benefits. With powerful tools, companies can minimize costly downtime, increase throughput and optimize product yields.

Getting the most out of bulk chemical plants

The bulk chemicals industry is energy-intensive, producing products, such as ammonia, sulphuric acid, sodium hydroxide, chlorine and ethane, in high volumes and at low margins. Approximately 60 percent of energy use in the bulk chemicals industry is for feedstocks or raw materials used in the manufac-

turing process of chemicals. Most bulk chemicals are intermediate products used to produce final products, such as plastic containers or fertilizer. In general, bulk chemicals fall into four groups: organic chemicals; resins, synthetic rubber and fibers, inorganic chemicals and agricultural chemicals.

According to the Energy Information Administration (EIA), the value of bulk chemicals shipments is expected to grow to \$429 billion by 2025. As such, the global chemicals industry has witnessed rapid growth over the past decade, particularly in emerging countries like China. Many industry experts predict that at least half of the top ten chemical companies in the next ten years will come from China and the Middle East. Taking advantage of the shale gas boom resulting in cheaper feedstocks in the US, the chemical industry there is also strong. On the other hand, Europe will continue to experience slow growth with the on-going threat of chemical plant closures due to strong competition.

Reducing production costs is important for basic chemical producers and there is a strong recognition among industry leaders that technology can help significantly in driving the overall operational effectiveness of plants. For example, PwC recently completed its "Breakthrough Innovation and Growth" survey of nearly 1,800 C-suite executive-level respondents, including some 50 chemicals industry participants from 12 countries. Ninety-five percent of chemicals industry respondents said they foresaw digital technology innovation at their company over the next three years and 50 percent expected breakthrough or radical advances.

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Supporting operations with rigorous models

Investments in optimization software can increase reliability, reduce costs and create greater operational efficiencies in production and supply chain management. Embracing advanced integrated software solutions empower staff to optimize operations and take advantage of market opportunities.

The advanced engineering software available today addresses operational challenges by providing integrated solutions that tackle inefficiencies end-to-end throughout engineering, planning and scheduling and plant operations processes. Companies deploying the innovative software are able to generate millions of dollars of benefits per year per plant with payback in months instead of years. These advanced solutions bring broad benefits with respect to yield, quality, energy use, operational costs and process flexibility. This includes controlling the process with advanced process control, collection and analyzing data from the process with manufacturing executions systems, modelling the process with integrated simulators, improving the supply chain, inside and outside the plant and improving the process.

Making it easier to quickly get to the root cause of operational issues is vital to plant engineers. For example, through a familiar Excel interface, engineers and operators have the benefits of using a rigorous process simulator. This helps engineers tackle process instability by determining variable sensitivity and creating what-if scenarios of different process operations without needing to disrupt the plant. Using these intuitive tools, it is also easy to determine an optimal maintenance schedule by monitoring equipment performance (i.e. heat exchangers, reactors, columns).

Building the model

Being able to visualize plant data and predict values of process variables is essential when it comes to developing a model-based culture. Viewing contextual data alongside process data to show what is happening in production delivers greater insights into the source of problems. The process model drives value in plant operations, and by being detailed enough can robustly predict real plant behavior over an expected range of conditions linked to process data. The data itself is conditioned to smooth out measurement errors with an execution environment to run the model whether on-demand, scheduled or event-driven.

Using advanced integrated tools, the process engineer can build a model of the unit and validate it against plant data from the production engineer and the plant data historian. The model is then used to identify alternate operating conditions. By building

an interface in Excel on top of the rigorous plant model and linking it with plant data tags, the chemical production engineer can use the model to identify alternate operating conditions. To take model-based operations to the next level, engineers can reconcile the model as the model runs online. Data is then saved in the data historian, so the production engineer can see immediately how the model changes over time. After using Real-Time Optimization (RTO) to deploy the model 24/7, the model calibrates itself daily and provides optimized set points to the process control system. The plant is then able to reach and maintain capacities higher than ever previously seen and frees up significant time for the unit engineer. Using a custom modeler makes it quick and easy to create unique process and equipment simulations that can be customized with accuracy and ease. The software helps to build custom forms and plots for customized models, so it is easy to lay out data in a way that makes sense to the engineer.

Integrated software for chemicals supports cross-functional collaboration through the use of consistent models and data. By driving process improvements and innovative designs through rigorous plant models, companies can:

- Increase capacity and decrease energy
- Improve yield and margins
- Reduce capital and operating costs
- Increase engineering efficiency
- Bring new products and designs to market faster at a higher return on investment

Model for success

Chemical companies continue to experience volatility in commodity prices and increased competition with much of the market shifting eastwards. Many global chemicals companies are striving to tap into this booming business, even though they face strong rivalry from local companies in supply and demand.

Addressing asset optimization needs to be done in a holistic way to tackle debottlenecking issues and overcome operational complexities to produce higher product quality and yields at reduced costs. Better operating strategies can reduce overall costs, which include better energy usage, utility cost optimization, improving operating work process efficiency and lowering maintenance costs to help manufacturers be more profitable. Those bulk chemical firms that implement a model-based culture using cutting-edge technologies will improve end-to-end production performance and remain competitive in an uncertain marketplace.

Results from 2016 Salary Survey

By Rick Zabel, Managing Director, Publisher, and Occasional Editor of Automation.com
Copyright © 2016 September/October *InTech*.

Industry segment dictates pay

Not surprisingly, the biggest payer was the oil and gas industry segment at \$128,868. The largest number of responses came from the engineering consulting or systems integration segment (20.9%), where the average salary was \$118,613. The table to the right shows salaries by all industry segments.

Average salary by industry segment

Industry	Average salary	Percent respondents
Chemicals	\$115,589	8.8%
Engineering consulting or systems integration	\$118,613	21.4%
Food and beverage	\$97,600	4.7%
Industrial machinery and equipment	\$101,996	10.4%
Oil and gas	\$128,868	12.7%
Pharmaceuticals	\$115,153	3.1%
Utilities – electrical, natural gas, nuclear	\$114,647	9.4%
Utilities – water/wastewater	\$82,967	8.8%
Other	\$102,960	20.6%



Setting the Standard for Automation™

Claim your scholarship money today!

2017 Scholarships are now available
\$2,000 each

Application deadline:
28 February 2017

Awards announced:
April 2017



For Application and details go to:
<https://www.isa.org/chemical-and-petroleum-division/>

Don't wait! Apply today!

Program is made possible by corporate and private contributions to the ISA Educational Foundation.

Standards
Certification
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Conferences & Exhibits



2017 ChemPID Student Scholarship Application Form

The ISA Chemical and Petroleum Industries Division (ChemPID) is pleased to award up to \$2000 of scholarship money to encourage students to pursue higher education and careers in the Chemical and Petroleum Industries. Winners will also receive a complimentary 2-year ISA student membership, which includes a print subscription to ISA *InTech* magazine. **Applications will be accepted via email through 28 February 2017.** Winners will be notified by mid-March, 2017 via email, and will be required to provide a digital photo, a 3-4 sentence biography, and a 1-2 sentence "thank-you note" that can be quoted for publicity purposes. Scholarship monies will be dispersed by check and mailed after the winners are selected and the required documentation is received. Scholarships will be awarded at the sole discretion of the ChemPID scholarship committee with preference being given to students enrolled in technical programs that lead to careers in the Chemical and Petroleum Industries.

Special Criteria:

- Candidate is an ISA Student Member. **ISA Member #:** _____
- ChemPID member recommendation letter (Attach)

Member Name: _____ **ISA Member #:** _____

Eligibility Requirements Checklist (Must Comply with All)

- Currently attending 2-4 year university/college curriculum
- Confirmation of enrollment letter (Attach or provide scan of student card)
- 200-word essay about "Why I should win the scholarship" (Attach)
- Copy of previous year's academic transcript (Attach)

Applicant Name: _____ **Program of Study:** _____

Institution Name: _____

Institution Address: _____

Dean of Admissions Name: _____ **Institution Phone:** _____

Address While At School	Home Address
Street: _____ Apt: _____	Street: _____ Apt: _____
City: _____	City: _____
State: _____ Zip Code: _____	State: _____ Zip Code: _____
Country: _____	Country: _____
Phone: _____	Phone: _____
Email: _____	Email: _____

Applications must be submitted as scanned PDFs and emailed to the scholarship committee at: ISA.ChemPID@gmail.com

APPLICATIONS MUST BE RECEIVED BY 28 February 2017 (Extended Deadline)

www.isa.org/chempid

2017 ISA Division Symposia

ISA's unbiased technical conference programming provides access to worldwide experts and content on the latest technologies, trends, real-world challenges, and industry updates needed to remain competitive in today's marketplace.

Mark your calendars and make plans to attend an ISA technical conference program in 2017!

62nd Analysis Division Symposium (AD)

23–27 April 2017
Pasadena Convention Center
Pasadena, CA

2017 Food and Pharmaceutical Industries Symposium (FPID)

16–17 May 2017
Sheraton Framingham Hotel and Conference Center
Framingham, MA

17th Leak Detection and Repair—Fugitive Emissions Symposium (LDAR)

20–21 June 2017
The Tremont House/Wyndham Grand Hotel
Galveston, TX

60th Power Industry Division Symposium (POWID)

27–29 June 2017
Case Western Reserve University
Cleveland, OH

2017 Water/Wastewater and Automatic Controls Symposium (WWAC)

8–10 August 2017
Wyndham Lake Buena Vista
Orlando, FL

2017 Process Control & Safety Symposium and Exhibition (PCS)

7–9 November 2017
Houston Marriott Westchase
Houston, TX

63rd International Instrumentation Symposium (IIS)

Co-located with the 2017 PCS Symposium
8–9 November 2017
Houston Marriott Westchase
Houston, TX

**Great locations!
Awesome content!**

Find developing program details at:
www.isa.org/events



Welcome New ChemPID Members!

Abaas Ali Almari	Andres Vina	Brian Stich	DARUSMAN Abu Hassan
Abbad Cheik Mostafa	Andrew C. Berg	Brian Traczyk	David Andrade
Abdoulreza Allahverdi Garkani	Andrew Ofoedu	Britney Menconi	David Antonio Onofre Gonzalez
Abdu Kikhia	Andy Ricci	Bruce Dempsey	David Dykes
Abdullah Alhajri	Anees Latif	Bryan Crozier	David Hawn
Abdulmohsen Mohammed	Angel Elledge	Bryon Brandt	David Madarin Serghie
Bineisa	Anibal Galan Prado	Caitlin Melesky	David Navarro Perez
Abe Glazer	Anil Shinde	Carleton Cody Anderson	David Rowe
Abhishek Chauhan	ANOOP KUMAR GOEL	Carlos Calvo Valdés	David Skinner
Abin Jose	Anthony Satcher	Carlos Casado Cascado	David Tunick
Adam Hassan	Antonio Carreto	Carlos Chica Perez	David Walker
Adam Henderson	Antonio Garcia	Carlos Mañuico	Debashish Ghosh
Adam Sitar	Anuj Verma	Carlos Rosas	Deepak Balaraman
Adolfo R Martinez V	Anurag Chopra	Carlos Videla	Deon Mahaffie
Adrian Van Niekerk	Aown Abdullah Khan	Carolina Silvestre	Derek Howe
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Akshar Patel	Asep Karmana	Chintadri Anil	Diego Assereuy Lobão
Akshar Patel	Ashkan Motamed	Chisom Onuegbu	Diego Bertazzo
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Alex Wishart	Benjamin Mattson	Colby Thomas	Douglas Johnson
Alexander Lowe	Benjamin Penick	Colin Kelley	Dragos Valentin Dinu
Alexander Smith	Benjamin Perez	Colin Moore	Duali Munsin
Alexander Yousefian	Benjamin Saunders	Collin Oliver	Duffy Chisholm
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Ali Mohammed Alhammadi	Bill Bagshaw	Cory Olson	Earl Dailey
Ali Sadiq Al-Saffar	Billy Stuckey	Cory Thomas Klassen	EDGAR L BERNAL
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Amit Pawaskar	Brad McKay	Daniel Herreras	Emmanuel Onu
Ammar Abidali	Bradley Churchman	Daniel Lee	Enrique Cartajena
Amol Deshpande	Bradley Haley	Daniel White	Eric Teguaia
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Anas Abdullatif Almuiasel	Brandon Powell	Dante Cuellar	Erwin Brocato
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	Brett Llewellyn	Darien Watkins	
	Brian Robert Rhodes	Darrell Stelly	

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Evuen Okefe Terry	Ibrahim Hassan Afandi	Jonathan Walton	Lance Hyndman
Felipe Arroyo	Ibrahim Khalid Al-Najim	Joonas Starast	Lane Olsen
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Florian Dahm	IQBAL MALHOTRA	Jorge Diaz Martinez	Latteef Adekunle
Francisco J Rodriguez Torres	Irene Guzman Izquierdo	Jorge Hernandez	Leandro Lima De Rezende
Frank Cummings	Ivan Alfredo Ivanovs	José Caridad	Leandro Miguel Bermudez
Frank Silvani	Ivan Marin Fernandez	Jose E. Melendez	Munde
Fransisco Luis Martinez Ros	Ivan Paredes Ortega	Jose Hidalgo	Leo Martinez
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Garry Brell	Jaime Muñoz	Joseph J. Mancini	Lonnie Stephenson
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Geoff Scott	James Catlett	Juan Alejandro Villacorta	Lucas Rodrigues De Araújo
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George W Bohn	James L Powell	JUAN PABLO CAMPEROS	Luis Luque
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Gerardo Rodriguez	James Wilkinson	Julian Campuzano	Luther Meyer
Gerry Snowden	Jared Ronning	Julian Deleon	M. Rehan-UI- Haq
Ghassan Ahmed Jabali	Jason Laforest	Julian Rhodes	Maaz Masood
Gilles April	Jason Mikovich	Julian Steyn	Mahdi Ali Al-Mahmoud
Giorgio De Benedictis	Jason Popp	Julie Nicholson	Malik Al Rawahi
Gokul Deshpande	Jason Safarz	Justin Cegielski	Manas D Desai
Grace Mary Jose	Jason Taylor	Justin Grubka	Manav Rajvanshi
Grant Hesse	Javier Diaz Gutierrez	Justin Jacobs	Manuel Ardila Lopez
Greg Banner	Jay Mershon	Justin Schullek	Manuel Garcia Ruvalcaba
Greg Miller	Jay Taylor	Kalyani Natu	Manuel Lara
Greg Schmelig	Jazmon Simmons	Kamran Mojtehed	Manuel Llinas Martin
Gregg Parsons	Jeff Davis	Karthikeyan Tr	Manuel Rodriguez
Guilherme Amaral Brito Leite	Jeffy F J	Katherine Nadia Vera Toscano	Manuel Williamson
Guilherme Formiga	Jehun Han	Katherine Prem	Maqdam Mamata
Hadi Ibrahim Al-Sadah	Jennifer Choi	Kathleen Rapacki	Marah Krasnow
Hadi Malik Al-Khamis	Jeremy Wilson	Kaustubh Dabholkar	Marcelo Penha
Hannah Middleswart	Jeromy Pinkham	Kaveh Geramifar	Marco Antonio Coghi
Hari Haran	Jess Pollino	Kayla Boudreaux	Marcos Peverati
Haridass Ramadoss	Jesus A Albornoz	Ke Song	Marcus Zapata
HARINI DEVI R	Jim Polk	KEERTHI CHACKO	Marcy R Osowetski
Harsh Shastri	Jim Scoggins	Keita Mohammed	Maria Eugenia Ramirez Cano
Harshada Fegade	Jin Zhao	Keith Hunter	Maria Isabel Bonacia Alvarado
Harshine Varuna Visvanathan	Joe Cookston	KELVIN UGWUOKE	Maria Mustafa
Harshit Sharma	John Carvalho	Kenneth (kenny) G Smith Jr	Maria Yolanda De La Cruz
Harvey Weaver	John Chavez	Kenneth Fox	Crespillo
Hassan Ahmed Al-Zoweed	John Crosman	Kenneth Gan Kae Lih	Mario Gonzalez
Hassan Ali Alqallaf	John Dunn	Kenneth Lowery	Mario Perez Marin
Hassan Fahd Al-Amer	John Flynn	Kenneth Madueno	Mario Testino
Hassan Mohammed Al-Oufi	John Houseman	Kent Mitchell	Mark A. Imper
Hassan Taher	John Kirkman	Kevin Busch	Mark Hereth
Haythem Ebrahim	John Loyd	Kevin Habig	Mark McDowell
Héctor Alejandro Argumedo	John McFarland	Kevin M Bobbitt	Marki Shedd
Martínez	John R Davis	Kevin Rhodes	Martín M Marquez Moreno
Helder Lee	John Schappert	Khalaf Awadh Al-Ajmi	Matt Durdin
Helder Santos	John Terry	Khaled Khaldi	Matt Johnston
Herman Coward	John Thro	KHAN IQBAL	Matthew Caslow
Hidekazu Kugemoto	John Tomford	Kishore Annadurai	Matthew Murray
Hinton Armstrong	John Wilhite	Klaus Saabye	Matthew Ruth
Hisham Teggaz	Johnathan Stastny	Kody Smajstrla	Matthew Smith
Hugh Miller	Johnathan Stringer	Kole Shannon	Mauro Contreras
Hunter Christensen	JOHNSON UZOMAH	Kris Akre	Max Tinsley
Hussain Adnan Al-Salman	Jolene Martin	Kris Cantlon	Mehdi Ahmadi
Hussain Sheer	Jonatan Torres	Kris Wilkerson	Melinda Duong

Melissa Riedthaler	Nirupama Gopaldaswami	Ricardo Avila	Siddharth Soni
Melvin Triay	Nithin Nasimudeen	Ricardo Roxas	Sivasankara Pillai Syam
Meridian Cunningham	Niyantha Raman R	Rich Garcia	Somnath Banerjee
Michael A Sparrow	Nordel Sweetland	Richard A. Stringham	Sonal Gandhi
Michael Brown	Norm Tatz	Richard Jassel	Sriram Ramalingam
Michael Cadwallader	Norma Chauca Cure	Rick Adams	Stephanie Contee
Michael Crotty	Olayinka James	Rober Blaker	Stephen Batson
Michael D Morrison	Omar Shaker Alzahrani	Robert Crowe Jr.	Stephen Kabantiok
Michael Davenport	Oriol Queralt Grau	Robert Erwin	STEPHEN ONWUGHALU
Michael Lewis	Osmar Noe Guerrero Barron	Robert Lau	Stephen Severson
Michael Mouton	Owen McCaughan	Robert Madrigal	Steve Easton
Michael Nour	Pablo Alcaraz Zaplana	Robert Prakash	Steven McDonnell
Michael Phelps	Pablo Jimenez Domiguez	Robert Sammons	Steven P Murphy
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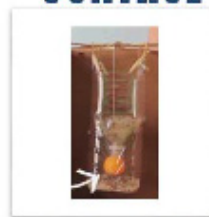
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