Chair’s Message

In the immortal words of Charles Dickens from the opening lines of his 1859 classic, *A Tale of Two Cities*, “It was the best of times, it was the worst of times”. The University of Hawaii is suffering the worst budget shortfall in my 32 year association with the school, probably the second worst in the school’s 102 year history, second only to the great depression of the 1930s. As the State economy is dependent on tourism revenues and tourism is in a tailspin, the State government has chosen to take a gargantuan and deeply painful bite out of the UH Manoa budget, by some counts, in excess of 20% of the State funds received by Manoa. Much of this is being passed down to the department level. In ORE, this means essentially removing all funds for anything except salaries. On the other hand, the growing realization of climate change fostered by inappropriate release of carbon dioxide from the burning of fossil fuels, as well as the realization that oil resources are approaching a phase of rapid decline has ushered in a scramble for new energy options. Many of these are ocean energies: offshore winds, waves, tides, tidal currents, ocean thermal energy conversion, methane hydrates and marine-derived biofuels. The level of engineering challenges to bring any one of these options into meaningful commercial production is immense. This translates to the present demand for ocean engineers being greater than in recent memory. In Hawaii, both wave energy and OTEC plants are scheduled for installation, which will result in the need for ocean observation, wave forecasting models, ocean temperature models, analysis of pipe strength, corrosion, heat exchanger design, component survivability, grid connection studies, including deep water power cable design and routing, etc. The opportunities are great. In part because of this, ORE had almost double the number of new applicants for the Fall semester. After a rigorous selection process, 9 new students, with a variety of backgrounds and experiences, were admitted. We will highlight them in the student section. With the mentorship and encouragement of Dr. Cengiz Ertekin, the new students have already revitalized the Marine Technology Society and the Society of Naval Architects and Marine Engineers student chapters. We will look forward to working with them to make their experience in ORE rewarding.

Two new faces have joined the department and are featured in this newsletter; Dr. Gerard Nihous, formerly of the Hawaii Natural Energy Institute, has joined our ranks as Associate Professor, specializing in the area of offshore renewable energy, and Ms. Natalie Nagai who has taken over the administration of the ORE office from Edith Katada, who retired after 41 years of service. As the new come, so the old also leave. It is with sadness that this semester has brought the passing of the department’s founder, Dr. Charles Bretschneider, developer of the Breitschneider wave spectra model. Dr. Bretschneider had been fully retired from the Department since 1995 but continued to take an active interest in our progress. He passed away on September 27, 2009. A web page will be put on the Department website so that alumni and friends can add memories of this renowned ocean engineer. A full tribute is being prepared and will, in time, be published in several of the leading Ocean Engineering journals.

Warmest aloha,
John Wiltshire

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Photo of the issue: ORE smiles!

ORE BBQ; Saturday, September 19th, 2009.

ORE department family, friends, students and faculty gathered for a Saturday evening BBQ at In Chieh’s place in Kailua. Everybody brought food to share to complement the grilled fish and steaks made perfectly by the host.

Missing in this picture are Prof. Pawlak’s children, Joshua (8) and Jonah (5) who were watching TV, and Kyleanne, Ryan’s wife, who is taking the picture. Good food, nice people, and a beautiful place brought out a happy atmosphere, everybody smiles as seen in the photo!
Tribute

Charles Bretschneider 1920 — 2009

It would have been hard to predict the life trajectory of Charles L. Bretschneider from his beginnings in Red Owl South Dakota. However, he never lost the plain good sense and can-do attitude that were part of his early life on what was still then the American Frontier. His horizons expanded considerably with his service in the U.S. Army Air Corps in India, Burma and China during World War II. After the war Charles Bretschneider honed his new interest in meteorology and oceanography with a B.S. in Physics from Hillsdale College in Michigan, an M.S. in Civil Engineering from the University of California at Berkeley and a Ph.D. in Oceanography from Texas A&M. He then made significant contributions to the field of coastal engineering through service to the U.S. Army Corps of Engineers — especially with respect to the U.S. Gulf of Mexico coast and the U.S. East coast. Dr. Bretschneider also has a distinguished record as an international engineering and legal consultant.

Meanwhile in Hawaii the U.S. Army Corps of Engineers established the J.K.K. Look Laboratory of Oceanographic Engineering to study tsunamis — especially their effects on the Hilo Bay coastline. This laboratory was turned over to the University of Hawaii in 1964 and formed the basis for establishing the Department of Ocean Engineering. Dr. Charles Bretschneider was chosen to head one of the first of its kind academic program. He soon attracted a distinguished international faculty and launched the department, that continues to this day, to bring students and visiting scholars from all over the world to Hawaii.

Dr. Bretschneider had a deep — essentially intuitive — understanding of the physical phenomena in the fields of meteorology, oceanography and ocean engineering. This understanding often led him to new blinding insights which he would calmly proclaim and then let his graduate students work out the details.

Dr. Bretschneider retired from the department he founded in 1995 but kept in touch through his friend, Edith Katada — the original Departmental Secretary who typed his original employment forms.

Upcoming Meetings and Conferences

29th International Conference on Ocean, Offshore and Arctic Engineering (OMAE 2010), Shanghai, China, 6-11 June, 2010
http://www.asmeconferences.org/OMAE2010/

PACific CONgress on Marine Science & Technology (PACON), Hilo, Hawaii, 1-5 June, 2010
http://www.hawaii.edu/pacon/

2010 Ocean Sciences Meeting, Portland, Oregon, 22-26 February 2010
http://www.agu.org/meetings/os10/

Meeting of the Acoustical Society of America, Baltimore, Maryland, 19-23 April 2010
http://asa.aip.org/meetings.html

A Workshop on CFD in Ship Hydrodynamics, Gothenburg, Sweden, 9-11 June 2010
http://www.gothenburg2010.org/

Renewable Energy 2010, International Conference and Exhibition, Yokohama, Japan, 27 June - 2 July 2010
http://www.re2010.org/
The Department of Ocean and Resources Engineering admitted 14 Masters and PhD students in the Fall of 2007. Five have since graduated and have immediately started their careers, in spite of the country facing one of its roughest economical situations. Nine students from that year are currently working on the last steps of their program, mainly their Master thesis.

In the Fall of 2008, only one master student was admitted, who is currently working on finishing his course work. Although analyzing the reasons for such a difference in the number of applications/admissions from a year to another requires a comprehensive discussion (which is out of the interest of this page) but accepting same number of students every year would be the ideal. This makes it easier for long-term planning, course offering and providing infrastructure for students.

Despite the financial problems, the number of applications and admitted students in the Fall of 2009 was surprising and promising news. Nine Masters and PhD students were admitted. You may learn more about each of them in this issue. Please join me in welcoming them to the ORE department and wishing them a good experience here in the department.

Shifting gears, reviewing the previous issue of the newsletter revealed that one of the concerns of the recently graduated ORE students was the lack of department social activities. The whole student activities, their social life and involvement were mainly summarized in only the annual department BBQ. This was discussed among students and it was concluded that regardless of the work load, most of the students are willing to be involved in activities and contribute to the department’s social life. The missing part of the puzzle was a sort of organized system. This issue was discussed in the student meeting on August 31st and a team of volunteer students was elected to be in charge of different activities throughout the next academic year. This is summarized in the Fall 2009 - Spring 2010 ORE student calendar and it is on the last page of this issue. As the first accomplishment of the calendar, the traditional Fall semester department BBQ was celebrated.

In Chieh, one of the Masters students, was the perfect host for the event. The BBQ was attended by about 30 people and was held on Saturday, September 19th in Kailua. The photo of this issue on the first page is allocated to this BBQ.

Vanna and Patrick, two Masters students, are in charge of the intramural activities for both Fall and Spring semesters. Their first accomplishment for the year was forming the ORE football team and sending the team to the UH flag football tournament, which took place in the lower campus football field. 24 teams from different departments competed with each other. Although none of the department members are real football players, carrying the name of ORE was enough motivation to try as hard as possible, and they won the first game. Eventually, however, the team was dropped out of the tournament after losing two other games. This was the warm-up for ORE to be the champion in future tournaments. 'Viva' ORE! And we are all looking forward to the next tournament that Vanna and Patrick will organize.

At least two more department activities are going to happen in this Fall semester: Department hiking, which Mike will organize and the end-of-the-semester BBQ, which Troy will host.

Recycling of aluminum and plastic bottles was started in the department a few years ago. Justin, our PhD student, kindly agreed to be the volunteer in charge of this task for both Fall and Spring semesters. There is a need for more recycling boxes, so if any body happens to have extra boxes and could donate them to the department for this cause, we would appreciate your help. Once again, welcome to all the new students and best of luck for all those who are about to finish their program.

This is it for this issue of Hana O Ke Kai. Stay good, think well and do good things and hope to talk to you again soon.

Aloha and Mahalo

ORE men football team, the potential champion of the next year’s tournament!
The populous coastal plains of Hawaii are vulnerable to flood hazards associated with tsunamis, hurricanes, and high surf events. An elevated sea level due to global warming exacerbates these hazards by allowing the destructive energy further into the coastal zone and reducing the capacity of the drainage system. These phenomena will be especially pronounced in low-lying coastal areas already subject to periodic flooding due to rainfall and tidal events. The ORE Department has made great strides in modeling and mapping of these flood hazard areas in support of emergency planning and management in Hawaii.

While we cannot forecast tsunamigenic earthquakes or earthquakes in general, numerical modeling allows analysis of historical or potential tsunami events for development of mitigation plans and warning systems. A good example is the statewide tsunami inundation maps based on numerical modeling of the five trans-Pacific tsunamis that devastated the Hawaiian Islands during the last century. Another example is the use of a pre-computed database to reconstruct a tsunami in real-time from water-level data near the source. The method provides forecast guidance of tsunami heights across the Pacific basin for tsunami warning centers and civil defense agencies to assess the potential impacts. Numerical modeling can also improve understanding of flood hazards. The 2006 Kuril Island Tsunami, while not destructive to coastal infrastructure, resulted in persistent oscillations in Hawaii waters. Modeling of the tsunami event reveals well-defined oscillation patterns intrinsic to the bathymetry and confirms resonant amplification of tsunami waves along the Hawaiian Island chain. The high-energy regions, in fact, have been sites of damaging runup in prior trans-Pacific tsunamis. Knowledge of tsunami resonance along the Hawaiian Island chain has prompted emergency management agencies to modify their operation procedures.

The Federal Emergency Management Agency and Hawaii State Civil Defense recently developed the Hawaii Catastrophic Hurricane Operations Plan. This is the only catastrophic hurricane operations plan in the country that involved physics-based modeling of hurricane impacts. We utilized a suite of five interoperable numerical models to describe the winds, surge, waves, surfzone processes, and runup to delineate coastal flood hazards from ...

(Continued on page 5)
Yoshiki Yamazaki, PhD Candidate of Ocean and Resources Engineering, recently developed a numerical inundation model, known as NEOWAVE (Non-hydrostatic Evolution of Ocean WAVE). The model entered the 2009 Benchmark Challenge at the Inundation Science and Engineering Cooperative (ISEC) Community Workshop sponsored by the National Science Foundation. This is the premier workshop in the inundation modeling community that was held only four times since 1990. NEOWAVE correctly reproduced the energetic breaking waves and hydraulic processes over a complex reef system in the Tsunami Wave Basin at Oregon State University and won the competition from 7 numerical models developed in the US and Europe. The workshop organizer will announce the results in an upcoming issue of AGU Eos.

Master's student In Chieh Chen was awarded the University Research Council Student Research Excellence Award at the master's level for work incorporating voltammetry at the Kilo Nalu Nearshore Cabled Observatory, which provided the first voltammetric measurements conducted as part of a cabled observatory. Using voltammetry and the Kilo Nalu data stream, she was able to study the relation between physical, biological, and geochemical conditions and redox cycling in the top layers of permeable sediment by conducting vertical profiles and fixed-depth time series measurements.

Numerical Modeling …
(Continued from page 4)

... a series of Category IV hurricanes developed by the NWS Central Pacific Hurricane Center. A decision-support tool allows integration and display of the data products with critical infrastructure information. The statewide hurricane exercise Makani Pahili in early June provided an opportunity to validate and fine-tune the operations plan. Recent research of Volker Roeber and Yoshiki Yamazaki (both PhD Candidates of Ocean and Resources Engineering) has led to the development of wave transformation models that are uniquely suited for tropical coastal environment with fringing reefs. These models, which have been validated by laboratory experiments at Oregon State University's Tsunami Wave Basin, were initially developed to model tsunamis, but can be applied to flood hazards due to dam collapse, channel overflow, and high surf events. We are currently working on their extension for storm surge modeling to provide a comprehensive modeling system for coastal flood hazard assessment in Hawaii.

From Hawaii Catastrophic Hurricane Operations Plan Version 2.0
The 10th biennial SOEST Open House held on October 16th and 17th, 2009 was a huge success. The event was attended by over 5000 people, mostly primary and secondary students from around Oahu. The event was made possible by over 450 volunteers from SOEST, NOAA, and the Waikiki Aquarium.

ORE exhibits at the SOEST Open House included experiments in environmental fluid dynamics, videos of REMUS and the seafloor observatory at Kilo Nalu, demonstrations in underwater acoustics, and computer animations of tsunami models and experiments. Inevitably one of the most popular stops was the tsunami wave-tank demo, although smiling faces and raised hands at the other exhibits were clear indicators that students were eager and learning. Hopefully enthusiasm for ocean engineering was sparked in at least a few young minds.

Thanks to the many student and faculty volunteers from ORE who helped make our contribution to the SOEST open house a success & see you again in 2011!

Allen and Sergio make a tsunami in the wave tank. Other wave-tank demos showed how ocean waves are created and propagate.

Blue demonstrates the effects of pressure and compressibility by making a ‘diver’ bob up and down.

(Above) Kai talks about underwater acoustics. (Left) Nick uses Bernoulli’s principle to juggle a ping-pong ball with no hands.


Gérard Nihous joined the ORE Department this summer. His appointment follows the recent establishment of a National Marine Renewable Energy Center at SOEST by the U.S. Department of Energy. Set against a challenging economic background, Dr. Nihous’ hiring demonstrates a commitment by the University of Hawaii to bolster teaching and research in the fields of marine renewable energy and sustainable development.

Dr. Nihous graduated from the École Centrale de Paris (France) in 1979 before earning a Ph.D. in Ocean Engineering at the University of California, Berkeley in 1983. His thesis dealt with the modeling of slender wave power converters. He moved to Hawaii in 1987 to pursue research and development activities in all aspects of Ocean Thermal Energy Conversion (OTEC) for a decade or so. After teaching for a year at the University of Hiroshima (Japan), he returned to Hawaii and worked on the assessment of marine-based greenhouse gas mitigation technologies. In 2004, he joined the Hawaii Natural Energy Institute at UH to participate in research on marine methane hydrates.

In his new position, Dr. Nihous hopes to add strength to the considerable expertise already anchored at ORE. He sees the University and the Department as essential knowledge resources to help guide the State of Hawaii toward energy independence. Although very challenging to harness, from both technical and economic points of view, marine renewable energy forms represent the largest local power source available to the islands. Along the road to develop this untapped resource lie many opportunities for research, from system and component engineering, to accurate resource evaluation and environmental impact assessment.

Natalie Nagai joined the Department of Ocean and Resources Engineering in July 2008. She was originally employed as a UH researcher (sensory analysis of tropical crops) and also held administration positions in the College of Tropical Agriculture and Human Resources, Office of Research Services and at the John A. Burns School of Medicine. She received an MS in Food Science from the University of Hawaii investigating the utilization of gamma irradiation as a means of disinfestation of California citrus from the Mediterranean Fruit Fly. The Mediterranean Fruit Fly is still a potential threat to the fruit industry on the mainland US. Natalie has several publications in peer-reviewed scientific journals and presented papers at conferences.

Prior to the University, she worked in the private sector as a food scientist which involved new product development, sanitation, package materials, package labeling, quality control, and sales & promotion. Her forte was to take ideas from the laboratory concept to the full production line. She would like to concentrate her future studies in various aspects of food packaging which includes food label compliance, design, and the economics and safety of food package materials.

Her hobbies include singing with the Honolulu Symphony, various local choruses and formerly with the Hawaii Opera Theatre Chorus (for 24 years). She traveled to Japan, Russia, Estonia, East/West Germany, Finland, Czechoslovakia and New York’s Carnegie Hall to participate in choral concerts. Piano is her primary instrument and she was an organist for church services, funerals and weddings since the age of 10. Music composition is next on the list for Natalie. She has many compositions that just need to be committed to manuscript.

In addition to music, she used to delve in painting with oils and watercolor, which culminated in a one-man show. Her goal is to do at least one more solo art show in mixed media.
Welcome to ORE! Nine new graduate students were admitted to the ORE department and have already started their new lives here. A new postdoc. student also joined the department. They come from different places and backgrounds, but here, they join together to make a united family called ORE. In order to provide an opportunity for all ORE to know these new members better, each of them were asked to answer the following questions. Their answers are given in the same sequence as the questions. Best of luck for them.

Questions:
1. Name?
2. Level of study (M.Sc., Ph.D.)?
3. Your academic background?
4. Your research topic in the department?
5. Your advisor?
6. Only after being here for a month, what has attracted your attention about the program and department the most?
7. Anything else you would like to share with others?

1. Ryan Braman
2. M.Sc.
3. B.S. Political Science, US Air Force Academy; MBA, University of Maryland
4. no topic yet
5. Prof Cheung
6. ORE likes to party; plenty of opportunity to develop networks with local industry
7.

1. Mike Cregge
2. M.S.
3. United States Naval Academy c/o 2002, B.S Systems Engineering
4.
5. Dan Greeson, CAPT, USN (Ret.), Ph.D.
6. Everyone here has been very generous and willing to help me when I’m having trouble. Ultimately, what I enjoy about engineering is the way it causes me to look at the world differently. Water wave mechanics has already been rewarding in that regard.
7. I recently left the Navy and got married to Brenna. I was a submarine officer for 7 years and now I work full time for a company that does submarine/undersea R&D. Brenna and I are originally from Mililani, HI and you will find us surfing or stand-up paddleboarding on most weekends.

1. Jacob Foster
2. M.Sc.
3. Texas A&M University - Maritime Systems Engineering
4. Wave Energy Conversion
5. Dr. Reza Ghorbani
6. The camaraderie of the students!
7. I am a twin and I like to hike!

1. Kai Gemba
2. Ph.D.
3. B.S. Aerospace Engineering & Applied Math, M.S. Chemical Engineering
4. Acoustics
5. Eva-Marie Nosal
6. The Department BBQ.
7.
New ORE Students

1. Vanna Keller
2. MS
3. Texas A&M University - BS in Ocean Engineering
   (proudest member of the Fighting Texas Aggie class of 2009 WHOOP!)
4. Ocean Wave Energy
5. Professor Ertekin
6. From very early on, it has been obvious that our department has really top notch/cool students and faculty. I honestly thought we’d be a bunch of antisocial geeks. The department BBQ definitely has proved otherwise. We have a great group here!
7. Get excited about intramurals!

1. Shino Miyakita
2. Ph.D.
3. Bachelor - Civil Engineering at Yamaguchi University (Japan)
   Master - Civil Engineering at Yamaguchi University (Japan)
4.
5. Stephen M. Masutani
6. 7.

1. Matt Morita
2. M.S.
3. B.S. in Civil Engineering from Purdue University
4. Undecided
5. Dr. Cheung
6. The program is smaller than I expected but it seems to have excellent professors and research facilities.
7. I usually golf a few times a month. If anyone is interested in going golfing let me know.

1. Lauren Tuthill
2. M.S.
3. B.S. in Biomedical Engineering from Boston University
4.
5. Geno Pawlak
6. The people are great, and while it's a small department, it seems to have attracted some really great faculty.
7.

1. Max Young
2. M. Sc.
3. University of Notre Dame, B.S. in Mechanical Eg.
4. GA at HURL
5.
6. How friendly everyone is here.
7.

1. Ning Li
2. Post Doc.
3. 2004-2009: Master-Doctor combined program in School of Civil Engineering, Tianjin University, China.
4.
5. Kwok Fai Cheung
6. The interesting research direction and comfortable study environment.
7.
In the previous issue of the newsletter, 10 of the students who graduated after Fall 2007 were covered on the alumni page. In this issue, we are updated by the news of 4 recently graduated students. The questions are given below and their answers are given in the same sequence as the questions.

Questions:
1. Name?
2. Admission Date (Year and semester)?
3. Graduation Date?
4. Graduation level (MSc. or PhD)?
5. Advisor?
6. City and Country that you live in now?
7. One thing that you liked the most about ORE?
8. One thing that you would change in ORE?
9. A short description about your current professional life?
10. Something about your current personal life that you would like to share with others?
11. A message to the current ORE students, faculty and staff?

1. Miguel R. Quintero
2. Fall 2007
3. Summer 2009 (August 09)
4. MSc. (Offshore option)
5. Dr. Kwok Fai Cheung
6. Ft. Lauderdale, FL USA
7. The people. I really enjoyed getting to know everyone! I hope to stay in touch with all of you.
8. More social activities. I think we might of had two or three successful picnics, which is pretty lame when compared to the other depts at UH.
9. I am working for a small propulsion company named, Platzer Marine Propulsion. We design custom propellers, perform sea trials to analyze propeller noise and vibration, and also use a commercial CFD code to run seakeeping analysis. I have already been on two sea trials since I began work and I love it!
10. I am going to be an uncle around the second week on October! My sister is having her first baby boy and I couldn't be any happier than to be here with my family!
11. THANK YOU! I went through a very rough time during my father's fight with cancer and I really felt like everyone in the department was there for me when he passed in January. Y'all are family to me and I look forward to seeing you again in the future!!

1. David Wilkinson
2. Fall 07
3. Summer 09
4. MS
5. John Wiltshire
6. Ventura, CA
7. Location, location, location…(in other words—you can always find somewhere around the island to carry out your work)
8. Renovate ORE student areas.
9. Ocean Systems Division (U.S. Navy)
10. Looking forward to being able to do road trips again!!
11. Never forget the pleasure of the journey.

1. Liang Ge
2. 2004 Fall
3. 2009 Summer
4. PhD
5. Prof. Cheung
6. Honolulu, HI, USA
7. People are friendly.
8. Increase the faculty’s number
9. Coastal Engineer, mainly focus on modeling.
10. Hard work will be paid off.
11. Take care.

1. Yongyan Wu
2. Fall 2004
3. June 2009
4. Ph.D.
5. Dr. K.F. Cheung
6. Houston, TX
7. Great Location – Hawaii!
8. More connection with large international engineering companies
10. I relocated to Houston in July, and began to understand the words “Everything is big in Texas". I am planning my travels, driving to Florida this Christmas and to Alaska during next summer!
11. ORE is a great department with a very good reputation. I met a lot of alumni of ORE in Houston. They are very nice and helpful. I suggest current and future ORE students to have great dream and to work hard on your dream while enjoying your life in Hawaii. When you leave Hawaii, leave with the spirits of Aloha and Ohana in your hearts instead of Macadamia nuts in your packages (you can buy Macadamia nuts from any local Costco everywhere).
## Fall 2009 - Spring 2010 ORE Student Calendar

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Semester</th>
<th>Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Magazine Pick up</td>
<td>Fall 09</td>
<td>Mike Miller</td>
</tr>
<tr>
<td>2</td>
<td>Aluminum and Plastic Recycling</td>
<td>Fall 09 - Spring 10</td>
<td>Justin Stopa</td>
</tr>
<tr>
<td>3</td>
<td>Intramural Sport Activities</td>
<td>Fall 09 - Spring 10</td>
<td>Vanna Keller, Patrick Anderson</td>
</tr>
<tr>
<td>4</td>
<td>Hiking</td>
<td>Fall 09</td>
<td>Mike Miller</td>
</tr>
<tr>
<td>5</td>
<td>Hiking</td>
<td>Spring 10</td>
<td>Jacob Foster</td>
</tr>
<tr>
<td>6</td>
<td>Department BBQ</td>
<td>September 09</td>
<td>Inchieh Chen</td>
</tr>
<tr>
<td>7</td>
<td>Department BBQ</td>
<td>December 09</td>
<td>Troy Heitmann</td>
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<tr>
<td>8</td>
<td>Department BBQ</td>
<td>February 10</td>
<td>Masoud Hayatdavoodi</td>
</tr>
<tr>
<td>9</td>
<td>Department BBQ</td>
<td>May 10</td>
<td>Jacob Foster</td>
</tr>
<tr>
<td>10</td>
<td>Student Meeting</td>
<td>February 10</td>
<td>Masoud Hayatdavoodi</td>
</tr>
</tbody>
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