

31st USSD Annual Meeting and Conference

April 11-15, 2011



Hosted by

San Diego Consultants

Conference Theme

*21st Century Dam Design —
Advances and Adaptations*

Workshops — April 14

Modern Methods of Analysis and Design of Concrete Dams

Dam Failure Inundation Mapping

**Sheraton San Diego Hotel & Marina
San Diego, California**

Conference Overview

The 2011 USSD Conference theme is *21st Century Dam Design — Advances and Adaptations*. A key strength of USSD is the knowledge and experience of our members who serve on technical committees. These technical committees are dedicated to maintaining the “state of practice” in the analysis and design of dams and water resource projects — each from a specific technical perspective.

This 2011 USSD Conference provides the technical committees with the opportunity to examine relevant ideas to modern design and classical methods of analysis for concrete and embankment dams and levees. The Conference and Workshops will also provide a forum for dam engineers, owners, operators, environmental managers, and interest groups to share and discuss best practices and new technologies. Technical presentations will focus on construction and rehabilitation; hydraulics and hydrology; foundations; monitoring; safety, security and emergency response; seismic issues; and climate change.

The **Opening Plenary Session** on Tuesday morning will begin with ICOLD and ASDSO updates, followed by a Panel Discussion on management issues of the **San Vicente Dam Raise Project**. Additional presentations during the Plenary Session will address contemporary topics of interest to dam professionals.

Five **Concurrent Technical Sessions** on Tuesday afternoon and Wednesday, and a **Poster Session** Tuesday evening, will feature the presentation of more than 120 technical papers.

On Thursday morning, a 90-minute special session on technical and engineering aspects of the San Vicente Dam Raise Project will be held. Two Workshops will be offered on Thursday; and field tours on Thursday and Friday round out the outstanding Conference program.

Meal speakers include **Ziyad Duron**, Harvey Mudd College; and **Robert A. Turner**, New Orleans Levee Board.

The Wednesday Awards banquet will feature the presentation of the **Outstanding Paper Awards**, and awards for **Excellence in the Constructed Project** and **Lifetime Achievement**. The recipient of the third **President’s Award** and the winners of the 2011 **USSD Scholarships** will also be announced.

Acknowledgments

The Conference technical program was organized jointly by several USSD Committees under the leadership of **Michael F. Rogers**, MWH Americas, Inc.

Co-Hosts

The following San Diego area consulting firms will serve as Co-Hosts of the 31st Annual Meeting and Conference:

- **Black & Veatch Corporation**
- **GEI Consultants, Inc.**
- **Kleinfelder, Inc.**
- **MWH Americas, Inc.**
- **Parsons Water and Infrastructure Inc.**
- **URS Corporation**

Exhibition and Sponsorships

An **exhibition** featuring water resources related goods and services will be held during the Conference. The exhibition will open with a reception on Monday evening; continental breakfasts, lunches and breaks on Tuesday and Wednesday, and a reception Tuesday evening will be held in the exhibit area to ensure maximum interaction with Conference participants.

Sponsorships for Conference activities and products are also available. For exhibitor and sponsor information, go to www.usdams.org/11/exhibit.html.

Venue

The Conference will be held at the **Sheraton San Diego Hotel & Marina**. Located on scenic Harbor Island, overlooking the beautiful San Diego Bay, the hotel features newly renovated rooms, several restaurants and lounges, a spa and fitness center, tennis courts, jogging trails and three heated outdoor pools.

The Sheraton is within ten minutes of three of the city’s most popular dining and entertainment destinations: Old Town, Little Italy and the Gaslamp Quarter. Nearby Seaport Village offers boutique shops, restaurants and nightclubs.

The Hotel provides complimentary airport shuttle transportation.

Young Professionals

To encourage Young Professionals to participate in the Conference, a discounted registration rate is offered to those age 35 and under. A Tuesday evening dessert reception offers an opportunity for Young Professionals to network with the Board of Directors. And, an Outstanding Paper Award will go to a Young Professional Author.

USSD Committee Meetings

Committee Meetings, to be held on Monday, are an important part of the Annual Meeting. Committees meet for part or all day — a schedule will be available online a few weeks prior to the Conference. All Conference participants are welcome to attend these committee meetings:

- Awards
- Concrete
- Construction and Rehabilitation
- Dam Decommissioning
- Dam Safety and Dam Security
- Earthquakes
- Environment
- Foundations
- Hydraulics of Dams
- ICOLD Congress Papers
- Levees
- Materials for Embankment Dams
- Membership
- Monitoring of Dams and Their Foundations
- Newsletter
- Public Awareness
- Tailings Dams

Annual Meeting of Members

All Conference participants are invited to attend the USSD **Annual Meeting of Members** on Monday afternoon. Following a brief review of current USSD activities, Members will have an opportunity to present their ideas and suggestions about USSD to the Board of Directors.

Kick-Off Reception/Exhibition Opening

Each year, USSD Conference participants and guests look forward to the annual **Monday evening reception** to network, make new professional contacts and socialize. A highlight of this year's reception will be the opening of the **Exhibition**, featuring nearly 50 organizations offering products and services to the dam profession.

Online Conference Information

The Final Program, online registration and Exhibitor/Sponsor information and reservation forms are at www.usstdams.org/2011conf.html.

Hotel Reservations

The Conference and Workshops will be held at the **Sheraton San Diego Hotel & Marina**, 1380 Harbor Island Drive, San Diego, CA 92101, 619-291-2900, www.sheraton.com/sandiegomarina.

The special rate for USSD Conference participants is \$169 single or double, plus taxes and fees. For government employees, a limited number of rooms is available at \$131. To make reservations, call 877-734-2726, and request the special USSD rate. Or, take the link from the USSD website for Sheraton online reservations.

The room block rate is guaranteed only through **March 11**, or until the room block fills.

Conference and Workshop Registration

The **Conference Registration Fee** for the Annual Meeting and Conference includes:

- Conference Proceedings
- Technical sessions
- Monday evening kick-off reception
- Continental breakfasts Tuesday and Wednesday
- Lunches Tuesday and Wednesday
- Tuesday evening reception
- Wednesday reception and dinner
- Field Tour or a Workshop on Thursday, with lunch
- Thursday Evening San Diego Shuttle
- Friday Field Tour, with lunch

The fee is \$925 for USSD Members and \$1,025 for non-members, with a **\$100 discount for early registration**. A **Young Professional Fee** of \$450 is available to participants age 35 and younger. To receive the Early Registration Rate, you must register by **April 1**. The Late Registration Fee applies to registrations received after April 1 and on-site registrations. The Registration Fee can be paid by check; VISA, MasterCard or Discover; or purchase order.

Cancellation Policy: To receive a refund, USSD must receive notice of cancellation by the end of business on April 1. All refunds are subject to a \$25 processing fee. After April 1, the registration fee is not refundable, but substitutions are acceptable.

To register for the Conference or a Workshop, complete and return the Registration Form, or register online at www.usstdams.org/2011conf.html.

Thursday Evening San Diego Shuttle

Experience the dining and entertainment options of three of San Diego's top destinations — the Gaslamp Quarter, Little Italy and Old Town. Complimentary shuttle service will take Conference participants to and from these popular areas, home to dozens of restaurants, pubs and nightclubs, shops, theaters and art galleries.

Departures from the Sheraton will be hourly from 5:30 p.m. to 8:30 p.m.; the return trips will be hourly from 7:00 p.m. to 11:00 p.m.

Field Tours

On Thursday, participants will have the option of attending one of two Workshops or a Field Tour to the **San Vicente Dam Raise Project** and **Olivenhain Dam**. Both are key components of the **San Diego County Water Authority's** Emergency Storage Project, a system of reservoirs, interconnected pipelines and pumping stations designed to make water available to the San Diego region in the event of an interruption in imported water deliveries.

The Conference concludes with a Field Tour on Friday to the **Eastside Reservoir Project**, including Diamond Valley Lake, near Hemet, followed by a stop at a **Temecula Valley winery**. Each Field Tour includes lunch.

Thursday Field Tour

The **San Vicente Dam Raise Project** will raise the existing 220-foot-high dam, owned by the City of San Diego, by 117 feet to increase reservoir storage capacity by 152,000 acre-feet. The more than \$0.5 billion project will be the tallest dam raise in the United States and tallest roller compacted concrete dam raise in the world. The San Vicente Reservoir capacity will more than double, making it the largest single increase in water storage in the region's history.

During 2010, the new dam foundation was excavated, and the existing dam was prepared by removing two inches of weathered concrete from the downstream dam face. In recent months, the contractor began producing crushed aggregates for the more than 600,000 cubic yards of RCC that will be used to raise the dam. The aggregates will be mined from the existing hillsides of the former marina. The marina area serves not only as a quarry but also a temporary RCC production site. The RCC will be transported from the batch plants by a conveyor system.

Other work includes the excavation of a 25-foot-diameter, 600-foot-long outlet works tunnel, and grouting operations, which include drilling holes in the new dam foundation and pumping in grout to fill voids and create a solid foundation for the raised dam.

An RCC trial placement will take place in early 2011. Placement of RCC for the main dam is scheduled to begin in mid-2011. Overall project completion is scheduled for early 2013.

Olivenhain Dam, completed in 2003, is 318 feet high and 2,570 feet long. Olivenhain was the first RCC dam built in California, and contains 1,400,000 cubic yards. The RCC was placed at then record rates of 16,000 cubic yards per day, in round-the-clock construction. The reservoir has a storage capacity of 24,000 acre-feet.

Friday Field Tour

Construction of the three dams in the **Eastside Reservoir Project** was completed in 1999, and the 4,500-acre reservoir site was filled in early 2002. Diamond Valley Lake is the largest reservoir in Southern California, storing about 800,000 acre-feet. At a cost of \$1.9 billion, Diamond Valley Lake almost doubled the storage capacity for the Metropolitan Water District of Southern California.

The three earth-core rock-fill dams are made from soil and rock materials obtained from borrow areas within the confines of the project. Core materials were obtained from the silty and clayey sandy alluvium in the floor of the reservoir and the rock fill came from the bedrock highlands of the reservoir's south rim.

The embankment designs of the three Eastside Reservoir dams are similar. The upstream and downstream slopes of the rock-fill shells are two horizontal to one vertical. The crest widths of the West and East dams are 40 feet, and the crest width of the Saddle Dam is 30 feet.

The Tour will include the Visitors Center which features a number of archeological finds, uncovered during construction.

A scenic drive back to San Diego through the rolling hills of the Temecula Valley, with a late lunch at a local winery, will conclude the tour.

Workshops

Two concurrent Workshops will be held from 10:00 a.m. to 5:00 p.m. on Thursday, April 14. Attendance at either Workshop is included in the Conference Registration Fee. For those **not** attending the Conference, the Workshop fee is \$250.

Modern Methods of Analysis and Design of Concrete Dams

Moderators — **William R. Fiedler**, Bureau of Reclamation; and **Guy S. Lund**, URS Corporation

This Workshop, organized by the **USSD Committee on Concrete Dams**, will focus on the analysis and evaluation of concrete dams. The Workshop will include discussions of failure case histories and potential failure modes, analysis/evaluation of both concrete dams and their foundations, and various presentations of modification and rehabilitation case studies. The analysis/evaluation portion of the Workshop will present both deterministic and risk-informed approaches and similarities and differences will be highlighted. Additional details of the individual Sessions:

Case Histories, and Potential Failure Modes

This sets the foundation for safety concerns regarding concrete dams. Case histories will be used to demonstrate the most likely failure modes currently understood for concrete dams, which include concrete overstressing, overturning (moment equilibrium), sliding (force equilibrium) in the foundation rock mass and within the body of the dam, and rock scour.

Foundation Stability Evaluation/Analysis

This session will focus on the potential instability within the foundation rock mass, and will include discussions on: geological considerations (joint orientation, spacing and continuity); photogrammetry/LIDAR techniques; formation of potential wedges in foundation; foundation stability analysis; and coupled analysis.

Types of Analyses

The session will discuss the different analysis types, starting with gravity methods, pseudo-static methods, pseudo-dynamic methods, finite element analyses, and finite difference analyses. A short presentation of each analysis type will be made, with pros and cons of each highlighted.

Model Calibration

This session will focus on techniques for calibrating numerical models and will include discussions on: field tests; using deformations to calibrate models; and dynamic tests and frequency evaluation.

Evaluating the Results

The purpose of this session is to summarize different criteria being used by different owners and regulatory agencies. These evaluations will include a presentation of traditional deterministic approaches as well as the recent developments in risk informed methods.

Rehabilitation and Modification

Summary of case studies that show methods to mitigate problems, when the results from analyses indicate that the safety is inadequate. This session will provide a summary of a wide range of modifications that have been applied to improve the stability of concrete dams.

Dam Failure Inundation Mapping

Moderators — **Jerry W. Webb**, Corps of Engineers; and **Martin J. Teal**, WEST Consultants, Inc.

This Workshop, organized by the **USSD Committee on Hydraulics of Dams**, will focus on the methods used by the Modeling, Mapping, and Consequences Production Center (MMC) in developing dam failure inundation mapping products for the Corps of Engineers. Sessions will begin with an overview of the process and products developed. Technical sessions will provide more detail into the technology and methods used to develop inundation mapping products.

Dam Failure Inundation Mapping in USACE

This session will focus on the current state of inundation mapping within the Corps of Engineers. Discussion of how the current state of inundation mapping for both consequence estimation and emergency planning lead into the development of the Modeling, Mapping, and Consequences Production Center. An overview of the inundation mapping products developed by the MMC will be provided.

Data Standards and Uses

Producing inundation mapping products at a national scale requires standardization in data sources. This session will discuss the datasets compiled for use by the MMC. Discussion will focus on the elevation data used for inundation delineation, specifically the usefulness of the National Elevation Dataset (NED) compared to other elevation data sources available (LIDAR, IFSAR, etc.).

Inundation Modeling

Hydraulic modeling can be accomplished using numerous tools. This session will concentrate on dam failure modeling using the Hydrologic Engineering Centers River Analysis System (HEC-RAS). Current best practices, as employed by the MMC, will be discussed, as well as future enhancements to HEC-RAS modeling software.

Inundation Mapping

The quality of dam failure inundation mapping for emergency action plans varies widely across the country. This session will discuss the development of standardized inundation mapping products. Mapping products such as paper inundation atlases, PDF inundation atlases, web-based maps and KMZ files will be covered. Access to finalized MMC mapping products for USACE will also be addressed.

Consequence Estimation

Accurate consequence estimates are essential to understanding the risk involved with any infrastructure. This session will concentrate on the calculation of consequences using the Hydrologic Engineering Centers Flow Impact Analysis (HEC-FIA) modeling software coupled with HEC-RAS hydraulic modeling. Best practices in consequence estimation and reporting will be discussed.

Communication and Data Dissemination

Making data available to stakeholders is the keystone in any modeling or mapping effort. This session will discuss the ongoing communications between the MMC and dam owners (USACE Districts) throughout the modeling and mapping process. Focus will be placed on the dissemination of draft and final modeling and mapping products to end users.

Continuing Education Units

Colorado State University, Division of Continuing Education, will grant CEUs after successful completion of the Conference and/or a Workshop. CEU information will be available at the Conference.

Guest Program

Guests will have an opportunity to meet and mingle during a coffee reception on Tuesday morning. A representative from the San Diego Visitors and Convention Bureau will introduce guests to the city and its many attractions. A Sheraton guest services representative will highlight hotel services and amenities. Guests will also enjoy the following Conference activities:

- Monday evening Kick-Off Reception
- Continental breakfasts on Tuesday and Wednesday
- Tuesday morning guest reception
- Reception on Tuesday evening
- Reception and awards banquet on Wednesday
- Field Tours and lunches on Thursday and Friday
- Thursday Evening San Diego Shuttle

The Guest Registration Fee is \$325.

Gray Line offers four-hour narrated city tours daily at 8:30 a.m., with pickup from the Sheraton Hotel. Reservation details will be available at the USSD Registration Desk in San Diego.

Guest Program Agenda

Monday, April 11

6:00 p.m. - 8:00 p.m. **Kick-Off Reception**

Tuesday, April 12

7:00 a.m. - 8:00 a.m. **Continental Breakfast**

10:00 a.m. - 11:00 a.m. **Meet & Mingle**

5:30 p.m. - 7:30 p.m. **Reception**

Wednesday, April 13

7:00 a.m. - 8:00 a.m. **Continental Breakfast**

7:00 p.m. - 10:00 p.m. **Reception and Dinner**

Thursday, April 14

10:00 a.m. - 5:00 p.m. **Field Tour and Lunch**

5:30 p.m. - 11:00 p.m. **San Diego Shuttle Service**

Friday, April 15

8:00 a.m. - 5:00 p.m. **Field Tour and Lunch**

Program Summary

Sunday, April 10

4:00 p.m. - 7:00 p.m.

Registration

Monday, April 11

7:00 a.m. - 6:00 p.m.

Registration

9:00 a.m. - 4:30 p.m.

Committee Meetings

4:30 p.m. - 6:00 p.m.

Annual Meeting of Members

6:00 p.m. - 8:00 p.m.

Kick-off Reception/Exhibition Opens

Tuesday, April 12

7:00 a.m. - 8:00 a.m.

Continental Breakfast in Exhibit Hall

7:00 a.m. - 5:30 p.m.

Registration

8:00 a.m. - 9:30 a.m.

Opening Plenary Session

9:30 a.m. - 10:00 a.m.

Break in Exhibit Hall

10:00 a.m. - 12:00 noon

Opening Plenary Session, continued

12:00 noon - 1:15 p.m.

Lunch with Speaker

1:30 p.m. - 3:00 p.m.

Five Concurrent Sessions 1

3:00 p.m. - 3:30 p.m.

Break in Exhibit Hall

3:30 p.m. - 5:30 p.m.

Five Concurrent Sessions 2

5:30 p.m. - 7:30 p.m.

Reception, Exhibition & Poster Session

Wednesday, April 13

7:00 a.m. - 8:00 a.m.

Continental Breakfast in Exhibit Hall

7:00 a.m. - 5:30 p.m.

Registration

8:00 a.m. - 9:30 a.m.

Five Concurrent Sessions 3

9:30 a.m. - 10:00 a.m.

Break in Exhibit Hall

10:00 a.m. - 12:00 noon

Five Concurrent Sessions 4

12:00 noon - 1:15 p.m.

Lunch with Speaker

1:30 p.m. - 3:00 p.m.

Five Concurrent Sessions 5

3:00 p.m. - 3:30 p.m.

Break in Exhibit Hall; Exhibition closes

3:30 p.m. - 5:30 p.m.

Five Concurrent Sessions 6

7:00 p.m. - 10:00 p.m.

Reception and Dinner

Thursday, April 14

7:30 a.m. - 8:00 a.m.

Workshop Registration

8:00 a.m. - 9:30 a.m.

Technical Session — San Vicente

9:30 a.m. - 10:00 a.m.

Break

10:00 a.m. - 5:00 p.m.

Concurrent Workshops

10:00 a.m. - 5:00 p.m.

Field Tour — Olivenhain Dam and San Vicente Dam Raise Project

5:30 p.m. - 11:00 p.m.

San Diego Shuttle Service

Friday, April 15

8:00 a.m. - 5:00 p.m.

Field Tour — Eastside Reservoir Project

USSD 2011 Annual Meeting and Conference and Workshops Registration Form

**To register, complete and return this Form to USSD,
or register online at www.usstdams.org/2011conf.html.**

Given Name _____ Family Name _____

Organization _____

Address _____

City _____ State/Province _____ Zip/Postal Code _____ Country _____

Telephone _____ Fax _____ E-mail _____

First Name or Nickname (for name tag) _____

Guest Name _____

Special Dietary Requirements — I do not eat _____

Arrival Date _____ Departure Date _____

With a 0, 1 or 2, indicate the number of participants and guests who will participate in the tours:

Thursday Field Tour _____ Friday Field Tour _____

USSD Conference Registration Fees

Conference fee, USSD Member Early* — \$825	\$ _____	Student Registration — \$150	\$ _____
Conference fee, USSD Member — \$925	\$ _____	(Includes all Conference activities except the Wednesday reception and dinner, a Thursday Workshop and the Thursday and Friday Field Tours.)	
Conference fee, Non-Member Early* — \$925	\$ _____	Student Concrete Dams Workshop — \$100	\$ _____
Conference fee, Non-Member — \$1025	\$ _____	Student Inundation Mapping Workshop — \$100	\$ _____
Conference fee, Young Professional — \$450	\$ _____	Student Field Tour Thursday — \$25	\$ _____
Author/Co-Author fee — \$775	\$ _____	Student Field Tour Friday — \$25	\$ _____
<i>Please check if you will attend a Workshop:</i>		Guest Registration — \$325	\$ _____
<input type="checkbox"/> Concrete Dams		(Includes Monday kick-off reception, Tuesday Meet and Mingle, Tuesday reception, Tuesday and Wednesday continental breakfasts, Wednesday reception and dinner, Thursday and Friday tours and lunches.)	
<input type="checkbox"/> Dam Failure Inundation Mapping			
Conference Attendee — No Fee for Workshop			
Workshop Only — \$250	\$ _____	Total Registration Fees	\$ _____

*To receive the **Early Registration Fee**, your **online registration**, or this Registration Form, must be received in Denver by **April 1**. The Late Registration Fee applies to registrations received after April 1 and on-site.

Payment should accompany this form. Pay by P.O.; cash; check; or VISA, MasterCard or Discover.

Check Enclosed Purchase Order # _____

VISA/MasterCard/Discover # _____

Expiration Date _____ Signature _____

Name on Credit Card _____

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