



PHOTO © BRUCE DIAMONTE

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SFO Terminal 2



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SC1 Data Center



PHOTO COURTESY OF JOEL LEWITZ

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Joel Lewitz Q&A



PHOTO COURTESY OF JIM FREEMANN

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San Mateo County Board Chambers

**And
more...**



PHOTO BY NICK ELIAS

Intrepid Electronic Systems Programs Fail Safe Fire Alarm System At Silicon Valley's Largest Data Center

The SC1 Data Center fire alarm system was programmed by Intrepid Electronic Systems and installed by Cupertino Electric, Inc.

Four levels of redundancy monitor 2,700 devices

Thanks to the procurement and programming skill of Intrepid Electronic Systems, it doesn't get any more fire-resistant in a data center than the fire alarm at the SC1 Data Center in Santa Clara.

The SC1 fire alarm system, installed by Cupertino Electric, Inc., offers four levels of redundancy throughout the data center and monitors 2,700 devices in Phase One, protecting the 360,000 square foot facility with a number of ultra safe options.

The fire alarm system includes both laser based incipient smoke detection as well as addressable smoke detectors, along with a double interlocked pre-action sprinkler system. The system can be monitored from the master control room, as well as from control panels found within each computer room.

(For a detailed look at how the Fire Alarm System works, see the Illustration on pages 4-5.)

DuPont Fabros Technology Inc. (NYSE:DFT), one of the country's leading data center owners, operators and developers of wholesale data centers, recently opened the SC1 facility, which is spread over 16 acres near San Jose. DuPont Fabros spared no expense to make all of its data center systems at SC1, including its fire and smoke alarm systems, as advanced as possible.

One of the center's objectives is to provide extensive monitoring to protect each tenant's critical load. SC1 offers 88,000 square feet of raised floor and 18.2 MW of available critical load. It is powered by its own dedicated substation.

Intrepid was hired by Cupertino Electric to procure, program and test the fire alarm system to fulfill DFT's rigorous fire alarm specifications.

Cupertino Electric, Inc., which helped engineer and installed the system, hired Intrepid, who called on Notifier, a leading fire alarm system equipment manufacturer, to provide the devices and monitoring stations for the networked system.



PHOTO BY NICK ELIAS

The Intrepid Electronic team, from left to right: John Akers, Robert Wilhelm, Brian Wynn and CC Biggs.

(Continued on Page 7)

Metropolitan Electrical Flies High At SFO's New Terminal 2



Metropolitan Electrical completed a state-of-the-art security system and Public Address Systems for the new Terminal 2 at San Francisco International Airport.

San Francisco International Airport's new Terminal 2 boasts a state-of-the-art security system as well as the airport's first Public Wireless Internet Access System, thanks to the work of Metropolitan Electrical Construction's Data Communication division.

As part of its \$11 million contract for Terminal 2, Metropolitan Electrical also completed the telecommunications cabling infrastructure, the Public Address Systems, and the Master Clock System, bringing security and continuity to travelers.

The new 640,000 square foot terminal, which houses Virgin America and American Airlines, opened its doors last April. A \$383 million renovation of the former International Terminal, it is the first airport terminal in the United States to be LEED® Gold certified.

Built through a partnership between project architect Gensler and Turner Construction, the terminal has 14 gates and an annual capacity of 5.5 million passengers. From its emphasis on

sustainability to its focus on an open, organic environment, the terminal is the first of its kind in the nation.

Metropolitan Electrical contributed to the emphasis on maintaining a green work place by providing electric cars and golf carts to deliver materials, and also by recycling all cardboard and other waste daily on site.

If you fly in or out of Terminal 2, it's easy to take advantage of many of the systems that Metropolitan Electrical designed and built. Thanks to their telecommunications cabling, you can check your email on the public Wi-Fi system, print boarding passes at the self-serve kiosks, or view arrival and departure times from the numerous flight information displays.

The 1200 speakers in the zones Public Address Systems designed by Metropolitan Electrical bring the terminal alive with background music and flight announcements in the boarding areas.

Metropolitan Electrical installed state-of-the-art Video Surveillance and Access Control Security Systems to ensure the



SFO Terminal 2 is the first airport terminal in the U.S. to be LEED Gold certified.

safety of passengers. The system includes body imaging equipment for the TSA area, baggage handling equipment to ensure the safety of the bags being put into the airplanes, and video surveillance. There are also electronic check-in counters, a digital information display system, and the wireless network infrastructure.

The security system includes access control for 151 doors and 275 video surveillance cameras to keep the terminal secure. The cameras used for the security system were heated so they would not fog when a photo is taken. They also have

cushion devices in case of a seismic event.

Metropolitan Electrical installed special cabling that ties into the baggage system containing detection sensors to find chemicals and explosive devices. A Master Clock System displays 13 digital displays throughout the terminal, all linked to a satellite clock.

Some 20 technicians from International Brotherhood of Electrical Workers (IBEW) Local 6 in San Francisco, IBEW Local 332 in San Jose and IBEW Local 617 in San Mateo worked on the project.

**VOICE
DATA
VIDEO**

**SOUND AND
COMMUNICATIONS**
of Northern California



PHOTO © BRUCE DANONTE

Metropolitan Electrical set-up two wireless internet systems, making Terminal 2 the first terminal at SFO where passengers have access to the wireless internet.

Metropolitan Electrical's work on the project began in 2009 during the design phase for the telecommunications infrastructure. They designed and engineered the fiber optic and copper backbone cabling, the horizontal cabling infrastructure - Commscope Systemax Structured Cabling Solutions- and the build-out of 10 telecommunication rooms.

"To build out the telecommunications infrastructure, we created over 110 sheets of design drawings," said Bob Rigling, the project manager for Metropolitan Electrical. "We went through 3 stages, including 50% Construction Design to 100% Construction Design and then into the final stage of construction documentation - IFC (issued

for construction)."

Metropolitan Electrical then installed the fiber optic and copper backbone systems to support Telephone, IT Networks and provide connections to other domestic and international terminals of airport. Fiber optic cables and copper cables connect Terminal 2 with Terminal 3 and the International Terminal.

The company then installed the horizontal cabling from the telecommunications room to the work area outlets (including digital display monitors and the master clock system). The final part of the installation was the telecommunication room build-out, which included the installation of cabinets,

equipment racks, and cable runways.

Metropolitan Electrical built ten telecommunication closets on two levels of the Terminal. There are 5 distributions closets on the ground level, four on the second level, and a server room on the ground level.

This is the first terminal at the San Francisco Airport where passengers have access to the wireless internet. "Metropolitan Electrical set up two wireless systems," said Gene Amchislavsky, who designed the system. "One system was set up for the airport maintenance personnel and the other was created for the passengers. The systems run in parallel, utilizing the same antenna

SFO Terminal 2 Project Team

CLIENT:

San Francisco International Airport

ARCHITECT:

Gensler

GENERAL CONTRACTOR:

Turner Construction Company

COMMUNICATIONS, SECURITY, DATA CONTRACTOR:

Metropolitan Electrical & Data Communications
 Nick Dutto, President/Owner;
 Doug Snodgrass, Vice President;
 Steve Borghello, Division Manager

PASSIVE SYSTEM CABLING:

Gene Amchislavsky, Estimating and Design
 Bob Rigling, Project Manager
 Mike Simonini, General Foreman
 Ken Browne, Foreman
 (Security Cabling & Install)

INSTALLER TECHNICIANS:

IBEW Local 6, IBEW Local 332,
 IBEW Local 617

(Wireless Access Point). Passengers cannot access maintenance systems that contain proprietary information, but have their own wireless system throughout the terminal."

"It was a challenge to design systems for such a large facility, and to meet the fast-track scheduling requirements so that the terminal would open on time," said Steve Borghello, Manager of Metropolitan Electrical's Data Communication Division. "Our project team was more than equal to the challenge."

For more information, contact Steve Borghello, Metropolitan Electrical, at sborghello@metroelectric.com, or call 415.642.3053.

Facts About Metropolitan Electrical's Data Communication Work At SFO Airport Terminal 2

- Made 14,500 fiber optic fusion splices
- Wired 15,000 copper terminations
- Installed access controlled security for 151 doors
- Installed 275 security cameras
- Installed 1200 speakers for the public address system

METROPOLITAN ELECTRICAL'S DATA COMMUNICATION SERVICES AT TERMINAL 2:

- Fiber optic and copper backbone cabling
- Horizontal Commscope Systemax Structured Cabling
- Build Out of 10 Telecommunication Rooms
- Security Access Control
- Video Surveillance Infrastructure
- Satellite Cable Television Network
- Master Clock System
- Public Address System



PHOTO COURTESY OF METROPOLITAN ELECTRICAL

The Metropolitan Electrical Team (from left to right): Nick Dutto, Mike Simonini, Ken Browne, Gene Amchislavsky, Bob Rigling.

Intrepid Electronic Systems Goes to San Jose's SC1

When Intrepid Electronic Systems programmed and tested the state-of-the-art fire alarm system for the DuPont Fabros Data Center (SC1) in Santa Clara, CA, a prime commercial location and eleven buildings were demolished so the data center could be constructed. Well-known in the data center world for its level of precision, Intrepid turned to Notifier to fulfill the fire alarm system design equipment specifications, testing a four-level redundant system that issues several levels of alarm equipment from water damage.

Computer Room Smoke Detectors

Each computer room is monitored by 200 spot smoke detectors - 100 in the ceiling and 100 under the four foot raised floor.



Computer Room Control Panel

Each computer room has several fire alarm control panels set up as a fail safe. These control panels allow an independent response by room to a localized incident involving the devices.



Computer Room Sprinkler System Monitors

Several pre-action devices monitor the sprinkler systems in each computer room.



SC1 Data Center Snapshot:

DEVELOPER AND MANAGER:

DuPont Fabros Technology, Inc. (NYSE: DFT)

SIZE:

360,000 square feet
176,000 raised square feet
36.4 MW of critical power
29,000 square foot substation

AREAS OF DATA CENTER:

Computer rooms to house servers; chiller plant; electrical equipment rooms; engine generator rooms; core office area

SC1 Data Center Fire Alarm Snapshot:

FIRE ALARM PROGRAMMER/TESTER

Intrepid Electronic Systems, Inc.
400 Market Street, Oakland, CA 94607
6300 San Ignacio Ave., Unit A, San Jose, CA 95119
510.496.5815
www.intrepidelectronics.com
Kurt Brinkman, CEO
kurt@intrepidelectronic.com

INTREPID ELECTRONIC PROJECT TEAM:

John "CC" Biggs, Branch Manager
ccbiggs@intrepidelectronic.com

TECHNICIANS FROM INTREPID:

Field Technicians provided by
IBEW Local 595 and 332
Brian Wynn; Robert Wilhelm; Dave Schreiber;
John Akers; Johnny Ponce

FIRE ALARM CONTRACTOR:

Cupertino Electric, Inc.
1132 North 7th Street, San Jose, CA 95112
408.808.8000
www.cei.com
Tony Locatelli
tony_locatelli@cei.com

CUPERTINO ELECTRIC STAFF:

Joe Gann, Superintendent
Rafael Flores, Senior Technician
Raul Martinez, Technician

Main Control Center

The building's central control room contains a state-of-the-art Notifier Onyx network fire alarm system. It monitors 11 separate fire alarm systems within the building, along with 2700 devices.

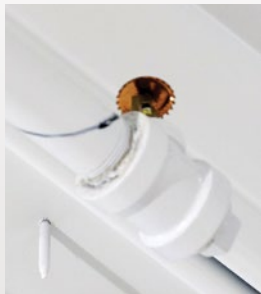


Gives Fail Safe Fire Protection C1 Data Center

California, they had to think big. The 360,000 square foot data center is one of the largest data centers ever built in Silicon Valley. It's spread over 16 acres of land. Using leading edge designs, DuPont Fabros spared no expense to make all of its systems, including its fire and smoke alarm systems, as advanced as possible. The system is designed to prevent an incident, while saving expensive computer equipment.

Computer Room Pre-Action System Valves

Each of the smoke detectors functions as a pre-action system valve. Each fills with water if smoke is detected, but as a safeguard, water isn't discharged until several other smoke detectors and devices go off.



Computer Room VESDA Systems

Four laser based VESDA smoke detectors are layered over the spot smoke detectors. The VESDA detectors run a laser light through the air sampling system looking for smoke.



High Temp Heat Detectors

High temp heat detectors sit above the diesel generators on the second floor.



Computer Room Four Levels of Alarms

Each computer room has 4 levels of alarms: an alert alarm, action alarm, and two backup alarms. When all four alarms go off, the spot smoke detector activates.



Computer Room Graphic Annunciator

A graphic annunciator display panel in the main control center monitors each computer room and indicates the zone and location of any fire alarm.



SC1 Data Center Project Team:

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DuPont Fabros Technology, Inc.
Paul Hopkins, Regional VP of Sales & Leasing
408.839.5700
phopkins@dft.com

ARCHITECT:
DVA Architects and CAS Architects

ENGINEER:
CCG Facilities Integration

STRUCTURAL:
Structural Engineers, Inc.

GENERAL CONTRACTOR:
Holder Construction

ELECTRICAL CONTRACTOR:
Cupertino Electric, Inc.

FIRE ALARM CONTRACTOR:
Intrepid Electronic Systems, Inc.

MECHANICAL/PLUMBING CONTRACTOR:
Southland Industries

CONTROLS:
ACCO

Audiovisual Consultant Joel Lewitz Forecasts The New AV World



Joel Lewitz PE, FASA is an expert in the design of audiovisual systems. He is a Principal Consultant at Rosen Goldberg Der & Lewitz of Larkspur, CA. Joel is a Fellow of the Acoustical Society of America with over 40 years of experience in sound system design. His project experience includes the Stanford Stadium, Stanford; The Kingdome, Seattle; SAFECO Field (Seattle Mariners Baseball Stadium), Seattle; Maples Pavilion, Stanford; Aloha Stadium, Honolulu; Herbst Theater, San Francisco; Paramount Theater, Oakland; the Hawaii Convention Center, Honolulu; and LDS Conference Center, Salt Lake City. Here he outlines ways to plan an effective AV system for a commercial venue, and discusses current AV trends.

Q: How did you become interested in AV design?

A: I took my master's degree in electrical engineering and went to work for an acoustical consulting firm designing sound systems for architectural acoustics projects. In the 1960's the display portion of AV was optical and analog. We had 35mm slide projectors, 16mm film projectors, opaque and overhead projectors and square projection screens. There was not much to AV design and very little integration of audio and video other than playback of sound tracks. Beginning in the 1970's and 1980's with the advent of computers, DSP (digital signal processing) and digital display systems, integrated audiovisual design became an essential part of most design projects.

Q: When you design an audiovisual system for a boardroom, what elements are important in today's world?

A: There are a number of elements that we look at in designing an optimal AV system. First, it's important to plan for present and future infrastructure requirements. This is critical to a successful, smooth running installation. Infrastructure requirement evaluation also includes comprehensive cable management and determination of the size, quantity and location of floor and table box types. We also analyze user needs, including the content and sources of the AV. It's also important to evaluate 120 volt AC power requirements, including load capacity and device locations. Selection of equipment is key, including reliability, location, and cooling requirements. Equipment usage evaluation also

includes looking at display devices such as flat panels, microphone and camera types, and loudspeakers.

We also look at various connectivity and compatibility issues; i.e., how does an external monitor or an iPad function as a display device with the system. We examine whether there is functionality and seamless wiring between devices, and whether there is a user friendly, streamlined user interface. We examine extended display identification data (EDID), to make sure that various digital devices are compatible, and we also take a look at high-bandwidth digital content protection. Lighting design, room acoustics, and teleconferencing needs are considered. Finally, we provide a clear and complete set of bid documents, to eliminate guesswork by the contractor, and to save the client money by eliminating change orders.

Q: When you design a telepresence room, what elements are important?

A: Telepresence is an enhanced form of video teleconferencing which offers more of a feeling that all participants are in the same room. Normal video teleconferencing is not room immersive. Telepresence puts both sides in the same room. Telepresence typically comes from a manufacturer as a package design. The existing infrastructure must match the package layout requirements. Telepresence specifications normally call for a series of fixed cameras, specifying typically two seats per camera. These cameras don't pan or zoom. Using this option, the far end of the room is 'there'; the image doesn't change. Then, the telepresence design must create an environment that mirrors the far end of the room through finishes, lighting, and acoustics. In order to install telepresence, you must have available bandwidth and echo cancellation ability.

Q: How can a customer plan so that they minimize AV costs down the line when change is necessary?

A: Customers must work with their AV consultants and installers and look at their needs down the line based on evolving technology. Most important is to provide adequate infrastructure for present and future needs. You also need to plan for an eventual implementation of video conferencing.

Q: What will the AV design of government buildings look like in 2015?

A: There are a number of trends that are fast becoming a reality. First is smart building management, which includes network control of many data features, including everything from AV and security to energy management. Second, BIM or Building Information Modeling (like the Autodesk® program Revit®) is coming into play. BIM uses electronic drawings and specifications tied to the building. This technology zooms into a virtual room and clicks on a component to find out when to replace projector lamps or order parts. With BIM, we will no longer be referring to rolls of drawings in a corner of the office. There will also be more Cat 6 cabling, more wireless signal paths, and more encryption enabled digital wireless microphones. More AV will be moving over corporate networks, as

more bandwidth becomes available. Finally, there will be more Audio Video Bridging (AVB) specifications that will allow time-synchronized low latency streaming services through IEEE 802 networks.

Q: Are there new regulations and trends affecting government building technology design?

A: Yes, there are a number of regulations that must be followed including revised ADA regulations and SCIF (Sensitive Compartmented Information Facility) regulations. A SCIF, pronounced "skiff", is an enclosed area within a building that is used to process high level classified information.



ERIC RORER PHOTOGRAPHY

Q: You recently completed an AV design at the new headquarters for the California State Compensation Insurance Fund in San Francisco. Can you tell us a bit about the project?

A: RGDL completed AV design for a telepresence room, 8th floor offices and 7th floor conference rooms and boardroom. RGDL designed the AV system for the new boardroom to accommodate a dais of 18 seats equipped with microphones and video monitors for viewing video sources. Behind the dais are dual projection screens for audience viewing of presented computer, blu-ray and cable video sources.

The boardroom operations are managed from a user touch panel at the dais, and/or a technical staff touch panel at the rear of the room. Video archiving of the meetings is achieved with a recordable DVD and camera system that automatically follows the person speaking at the dais with microphone gate enabled DSP and camera presets. The conference rooms are equipped with table box inputs, digital scaling and projection of sources, audio reinforcement, and controllability from wall mounted control panels.

Q: How do you like working with NECA/IBEW contractors and technicians?

A: NECA/IBEW contractors and technicians are great to work with. They receive excellent apprenticeship, mentoring and training in technical as well as safety, workmanship and ethics standards.

To contact Joel Lewitz, e-mail jlewitz@rgdlacoustics.com or call 415.464.0150, ext. 322.

The Network Fire Alarm System Installed by Cupertino Electric Has 200 Smoke Detectors In Each Computer Room - Continued From Page 1



Computer Room Fire System Control Panel.



Computer Room Smoke Detector - Located under the raised floor.



Water for the sprinkler system is held outside of the computer rooms to prevent accidental leaks.



The computer room VESDA system provides early smoke detection in the facility.

“Customers can feel comfortable that their mission critical infrastructure is being supported by a proven facility design and operations team.”

**- Paul Hopkins,
Regional VP of Sales and Leasing for DuPont Fabros Technology, Inc.**

DFT evolved its business model for SC1 from a proprietary state-of-the-art design that includes large high density computer rooms and an efficient evaporative chilled water mechanical plant. The facility is designed and constructed in accordance with LEED standards.

The facility currently has 5 carriers—AboveNet, AT&T, Layer 42, Silicon Valley Power Fiber Enterprise and Verizon—that are available for quick fiber deployment and to provide tenants with secure and diverse access to the facility. DFT deploys strong on-site operations teams at each facility to run, operate and provide its tenants with the ultimate in data center expertise.

Intrepid project manager CC Biggs said the networked fire alarm system is designed for maximum effectiveness. It includes a main control center that is monitored by DFT staff 24 hours a day. The center is networked with over 2,700 fire alarm system monitoring devices that are installed throughout the computer rooms in Phase One.

“Each computer room has 200 smoke detectors,” said Biggs. “100 are at the ceiling, and 100 are below the floor. We also have four VESDA laser activated smoke detectors in each room. These are layered over the spot smoke detectors, and are used as a way to prevent a potentially small incident from growing. The VESDA system detector runs a laser light through the air sampling system looking for smoke.”

Biggs says that each room also has its own control panel, a key part of the cross-zone double interlock fire alarm system. “These control panels allow an independent response by room to a localized incident,” said Biggs.

For more information, contact CC Biggs, Intrepid Electronic Systems, at ccbiggs@intrepidelectronic.com, or call 510.496.5851.

Where Can I Find A Fire Life Safety Systems Contractor?

AECO Systems Inc
Contact: Dave Millen
dave_millen@aeco-systems.com
3512 Breakwater Ct.
Hayward, CA 94545
(510) 342-0008
www.aeco-systems.com

AI's Certified Safe & Lock
Contact: Allen Woods
awoods@alsalarm.com
P.O. Box 968
Salida, CA 95368
(209) 524-9181
www.alsalarm.com

Cal Coast Telecom
Contact: Rick M. Radonich
rick@cctcom.net
886 Faulstich Court
San Jose, CA 95112
(408) 275-8888
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Cal Communication Service Inc.
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www.calcsc.com

Central Coast Systems
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Gills Electric, Inc.
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Idex Global Services
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Point One Electrical Systems Inc.
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Quality Sound
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Rosendin Electric
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RTS Systems & Design
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SignaWest Systems
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Smith & Sons Electric Inc.
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44081 S Grimmer Blvd.
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(510) 651-4994

Sprig Electric Company
Contact: Tim Martin
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San Jose, CA 95112
(408) 298-3134 x311
www.sprigelectric.com

Sunrise Systems LVC
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4319 N. Brawley Ave.
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www.sslvc.biz

The Facilities Group
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www.wpcs.com

Young Electric Co. Inc
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San Francisco, CA 94103
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For a complete listing of over 100 qualified Sound and Communications contractors, please visit www.norcalvdv.org.



PHOTO COURTESY OF JIM THELEMAN

ICS Revamps Audio/Video System For San Mateo County Board Chambers

San Mateo County Board Chambers.

When San Mateo County wanted to give its outdated Board Chambers a high tech face lift recently, it turned to Integrated Communication Systems (ICS) to upgrade its AV system. The Board Chambers are used frequently for official meetings and other events. In keeping with the need to inform the public on an ongoing basis, these meetings are then recorded and rebroadcast. Webcasts are also used for those who want to watch the proceedings by Internet.

ICS designed and programmed a new custom AV system that is more user-friendly for the audience. The new system also makes it easier for the public to view real time Board meetings online, see them on cable or access official video archives. Technician installers from IBEW Local 332 in San Jose worked on the project under the direction of ICS Project Manager Mark Berlo.

Berlo and his team replaced the old analog system with a new digital update that

supports HD video and HDMI sources and Blu-ray. The sound system includes new high quality directional microphones with LED rings. ICS rewired existing ceiling and dias speakers to improve performance. The audio DSP was upgraded using equipment best suited for voice lift and echo canceling.

Berlo's team also fabricated and installed the AV components, and renovated equipment within the adjoining control room, adding a camera and replacing the entire control system, including very user friendly custom button control.

The ICS team added side monitors on either side of the meeting dais and courtesy monitors for the audience, which makes it easier to view presentations. Touch screens with 21 inch monitors are installed at the seat of each board member to help them to better view agenda items and follow proceedings. "It's very useful to improve the efficiency of meetings," said Berlo.

San Mateo County administrators were very pleased with the results. "The San Mateo County Chambers are now 21st Century Compatible with the help of ICS and Mark Berlo," said San Mateo Assistant County Manager David Holland.

"Mark's team was responsive and innovative in designing an upgrade to our Chambers that stayed within budget, yet met our needs for the future in service to the public. The ICS design, including flat panel screens, digital audio and AV equipment, provides the flexibility for our many Board and Commission meetings."

For more information about the San Mateo Council Chambers, contact Aaron Colton or Mark Berlo at ICS, aaron.colton@ics-integration.com or mark.berlo@ics-integration.com or call 408.491.6000.

San Mateo Board Chambers Project Team:

CLIENT:

San Mateo County Board of Supervisors

AV SYSTEMS CONTRACTOR:

ICS, Mark Berlo, Project Manager

INSTALLER TECHNICIANS:

International Brotherhood of Electrical Workers (IBEW) Local 332, San Jose

KEY VENDORS:

Crestron, Video Switching and Control
Extron, Audio Amp
Polycom, Audio DSP
DaLite, Projection Screen
Eiki, Projector

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