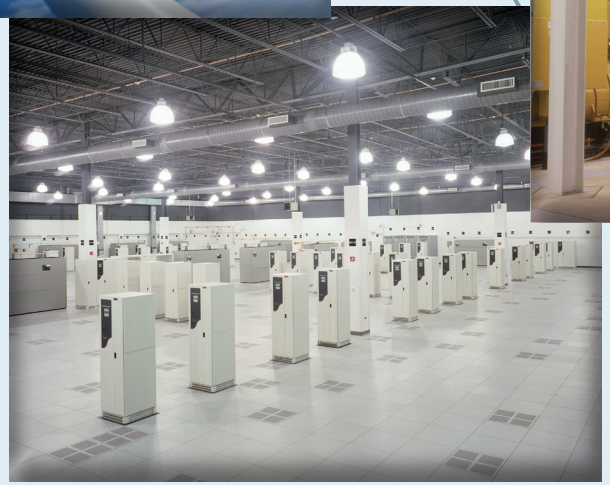
# RDMC

Data Center Consultants

NEW YORK • TEXAS • LONDON

7/24 Service: 877-682-5127


Mechanical Systems Electrical Systems Commissioning & Peer Review Forensics Studies Best Practices

# Mission

RDMC is a team of consulting experts dedicated to forging enduring relationships with its clients and whose passion is to achieve 100% uptime at Critical sites.

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# Overview

- Robert Derector Mission Critical (RDMC) has designed over 2 million square feet of high reliability Data Center and Trading facilities worldwide.
- We have offices in New York, Texas and London.
- Affiliate offices
  - Perkins Eastman - South America

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# Here's Who Trusts US


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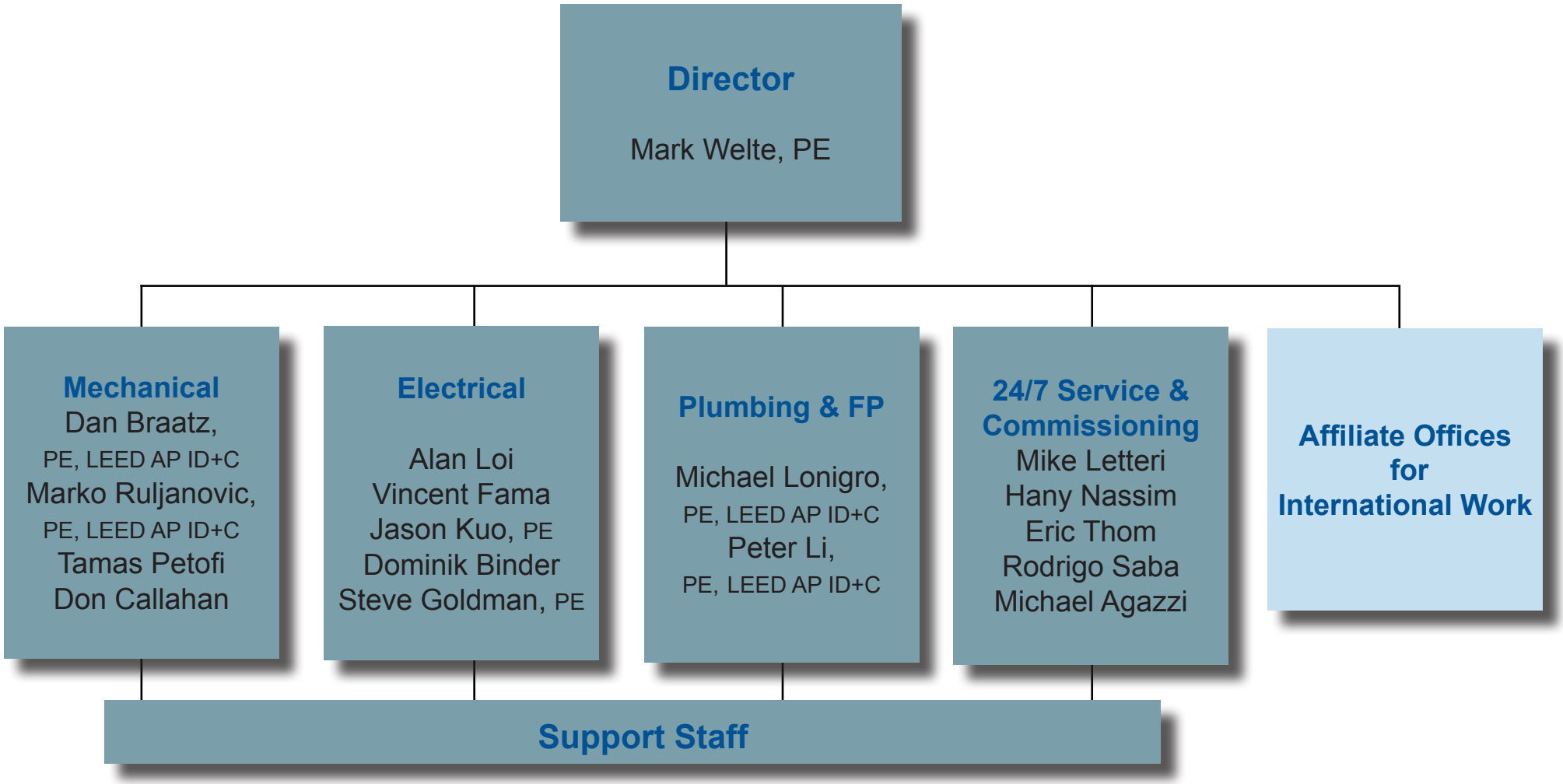
# Our Team

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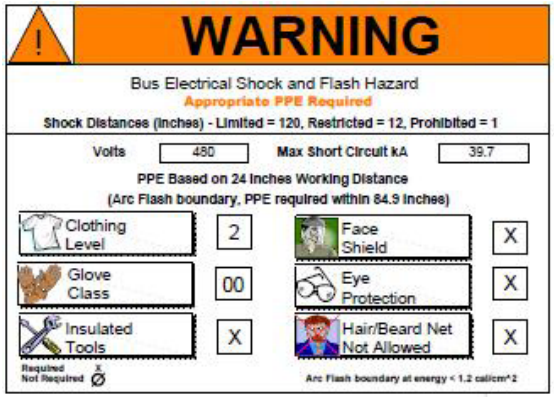
EasyPower®




# Services

## Mechanical Systems

PUE/Energy Modeling
CFD modeling
Failure Analysis
Chilled Water Storage
Rainwater Harvesting
High density IT cabinet cooling solutions

## Electrical Systems

Risk Assessments
Voltage Profile studies
Single points-of-failure analysis
Integrated BMS and power monitoring systems
EDSA/Paladin Analysis
Short circuit/coordination/Arc flash evaluations
575V Distribution

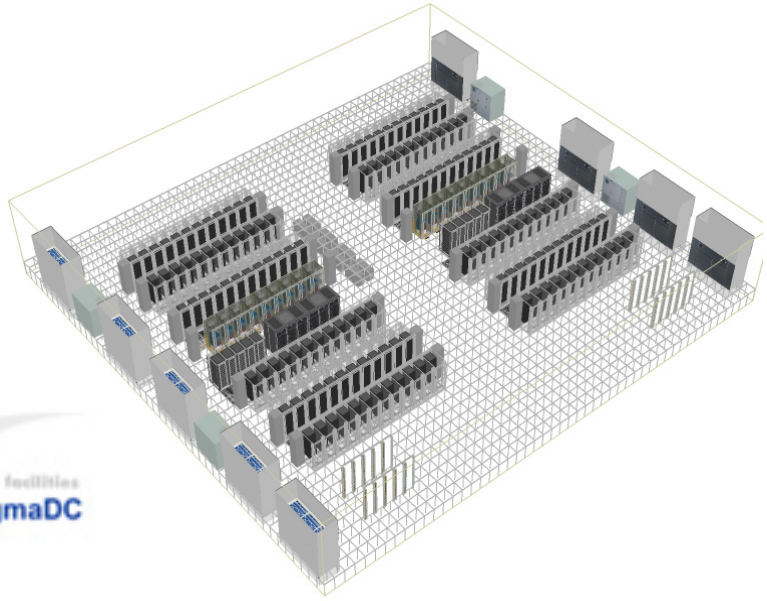
## Commissioning and Peer Review

Factory Witness Thru Integrated Site Testing
SOP's/EOP's
Fundamental and Enhanced LEED

## Plumbing & Fire Protection

ASSD and conventional smoke detection
Pre-action Sprinkler
Gaseous suppression

CFD Modeling



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6SigmaDC future facilities

# Services continued

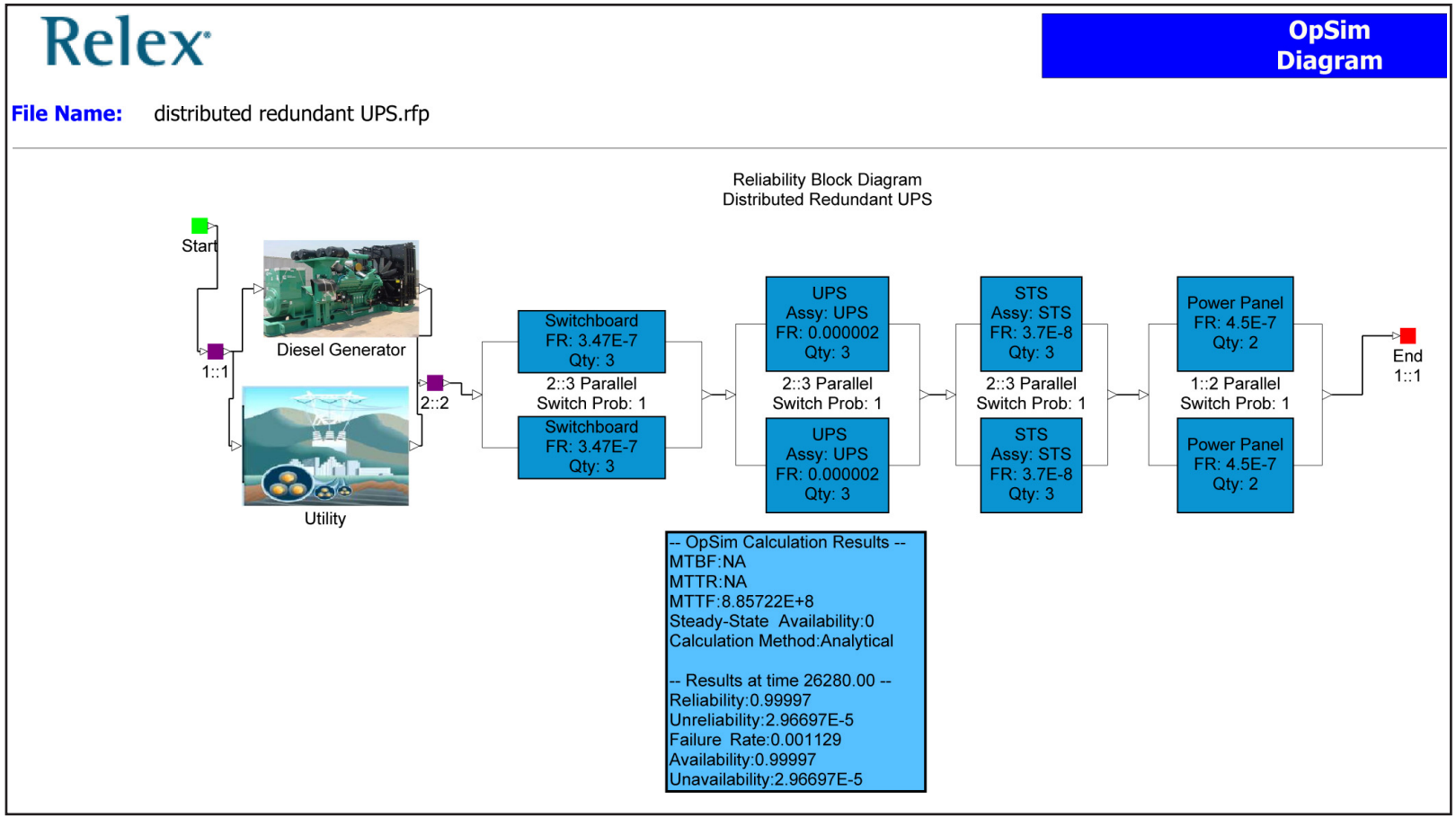
## Data Center Consulting

RDMC provides expert advice on how to modernize and retool your computer room to meet tomorrow's business needs.

Forensic Evaluations & Root Cause Failure Analysis

PRA (reliability) modeling

Reliability Model

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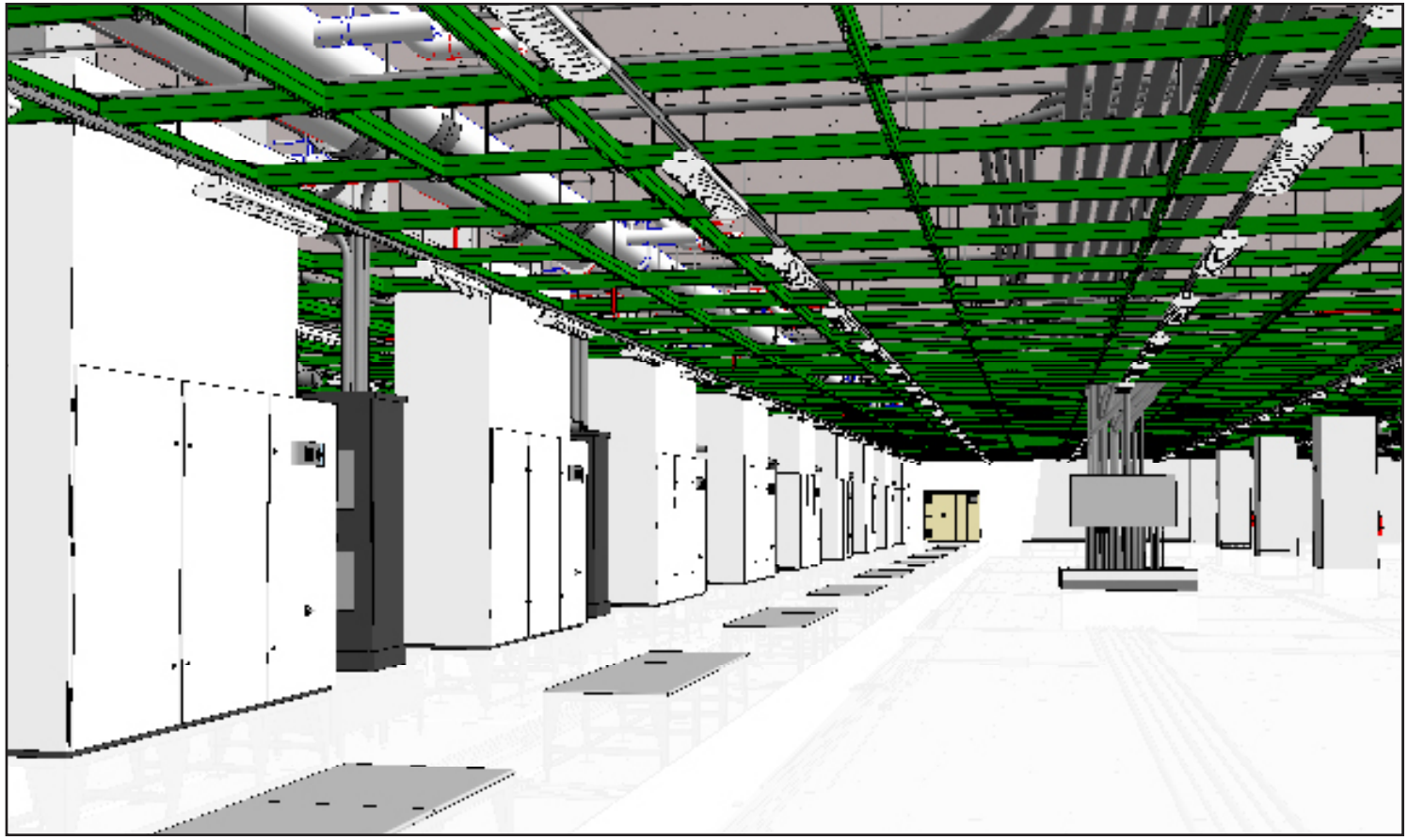
# Services continued

## CADD and Revit Enabled

Simplifies Construction

Save time and money



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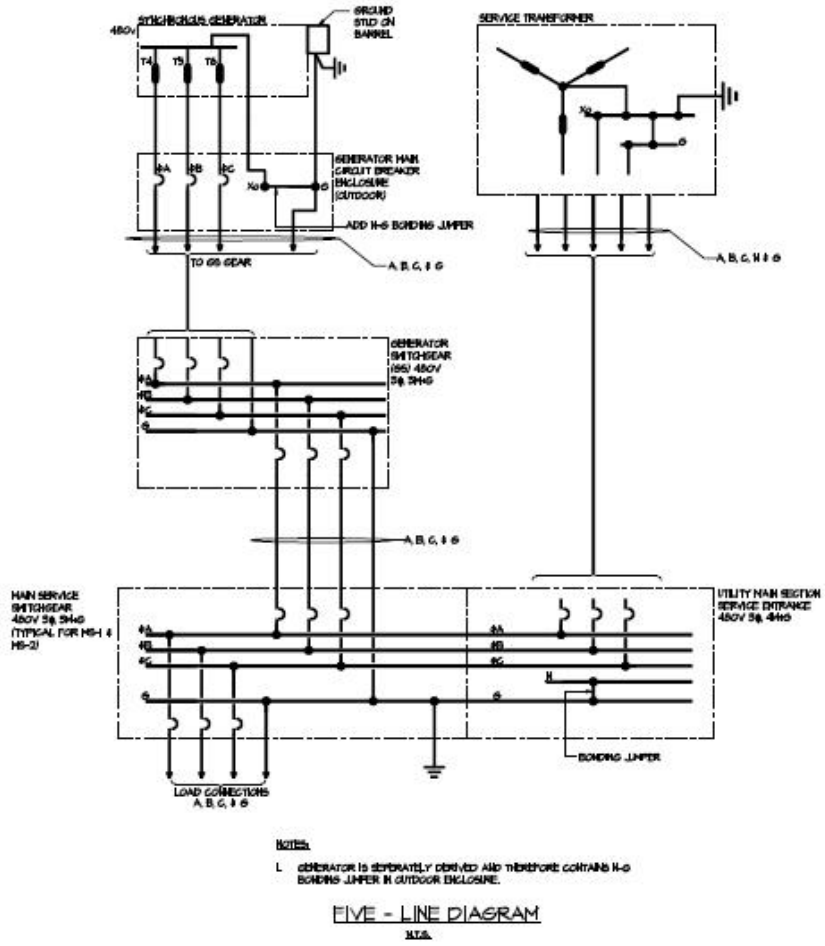
- **7/24 Service: 877-682-5127**

Robert Derector Mission Critical has a 7x24 Emergency Service Number With Technicians Available To Address Your Critical Environment Needs When They Cannot Wait Till The Next Business Day

Call this number and you will be connected to someone who can help you with your power and cooling issues before they jeopardize your business operation.

For the NY Metro Area, We can be On-Site in four hours in most cases.

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# Keeping Our Clients Up to Date with Industry Trends

# Data Center Update

June 2011

24/7 Service Hotline: 877.682.5127

Welcome to our update, created to provide you with a fresh perspective on critical environments.

## *Innovative In-Desk Cooling for Trading Desks*

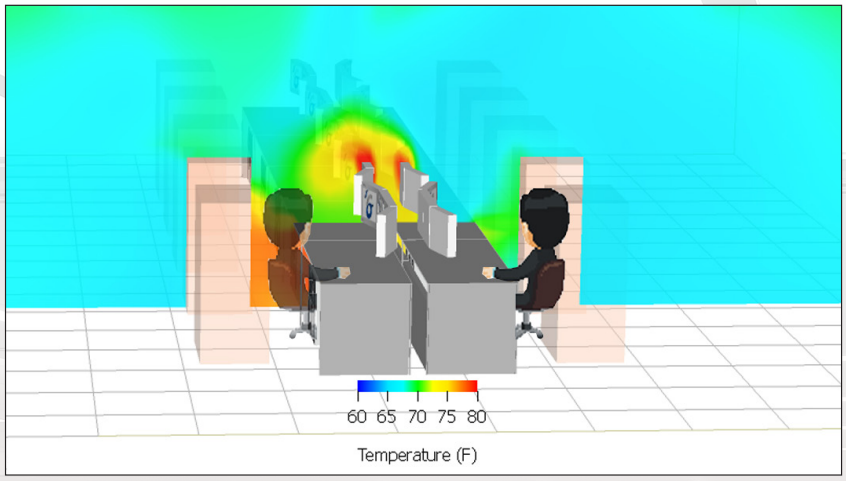


Figure 1 Trading floor with overhead Air Conditioning

By Tamas Petofi, an integral member of the RDMC Mechanical Engineering Staff and thought leader in CFD Analysis.

Many of today's legacy trading floors that utilize overhead air conditioning systems have shortfalls. In these applications, overhead duct-work is used to force air into the space to condition the PCs under the trader desks and the cluster of monitors on top. This usually results in a drafty room with traders complaining of cold backs and warm legs.

In actual installations, we have recorded temperatures under the desktops as high as 90$^0$F. Figure 1 shows a mock up using 6Simga CFD software demonstrating a row of trader desks. Notice how the heat is trapped under the desktops with a traditional overhead cooling system. Some have added fans to direct the hot air that is trapped under the desktops upward and away from the traders. This panacea has yielded inadequate results.

A new technology known as in-desk cooling is now available and it removes the heat at the source. It is a small fan coil unit that utilizes environmentally friendly $CO_2$ or water and can be placed between a pair of trading desks to remove the heat produced from the PCs and monitors. These units are sized to handle up to 2,600 watts of sensible load which is large enough to condition several high density trader desks.

In-desk cooling has several advantages to traditional overhead cooling systems. Figure 2 illustrates the use of an in-desk cooling system. Notice the improvement in comfort level under the desk. These units contain dual 120V fans configured for A+B power inputs and can be powered from an existing plug strip as they have a low power requirement. They contain no compressors or other rotating parts, are quiet, are electrically benign and, therefore, have a low carbon footprint. These products are available through TROX AITCS and SBFI and can be tied into a BMS network for monitoring.

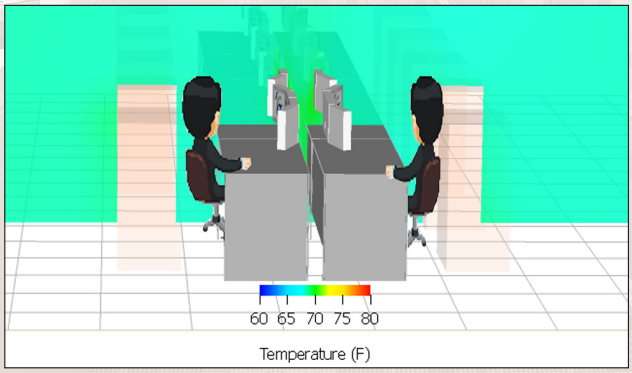


Figure 2 Trading floor with in-desk Air Conditioning

If you need expert help with air conditioning your trading floor or other critical environment needs, contact RDMC at 212-764-7272 or email us at info@rd-mc.com!

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Robert Derector Mission Critical
19 West 44th Street, New York, NY 10036 T. 212.764.7272 www.rd-mc.com

# Keeping Our Clients Up to Date with Industry Trends

# Data Center Update

November 2010

24/7 Service Hotline: 877.682.5127

Welcome to our update, created to provide you with a fresh perspective on Data Centers.

## Industry News

**The National Electric Code** (NEC) Article 645 got revamped in the 2011 National Electrical Code.

Technology room EPO buttons are no longer mandatory.

The emergency power off (EPO) has long been the Achilles Heel of technology rooms.

Unintended EPO activation accounts for nearly 30% of the total technology room crashes attributed to human error.

The 2011 NEC has two alternatives to the EPO that you now find in most legacy computer rooms.

One option permits the EPO to be placed outside of the computer room. It is no longer required to be at the principal exit doors within the computer room. However, it needs to be accessible to emergency responders.


The other option does not require an EPO provided certain conditions are met. These conditions can be met in most modern data centers today without any capital expenditure.

According to NFPA, 75% of the nation's Building Departments will have adopted the 2011 NEC by the end of next year.

Contact us to see how we can help you improve the uptime of your technology room.

## RDMC News

[ + ] We were recently awarded long term assignments in Mexico, Miami and South America, working with leading global providers of IT Infrastructure, one of the top global financial institutions and a global media corporation.

[ + ] It's been a busy year for Marko Ruljanovic, who received his PE license shortly after his LEED certification. Marko, a mechanical engineer, specializes in CFD modeling.

[ + ] Patrick Devlin, a veteran mechanical engineer, recently joined the firm and brings additional talent and youthful exuberance to our HVAC group.

Illustration by David Wilson at Downpour Creative

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For more information, visit us at www.rd-mc.com

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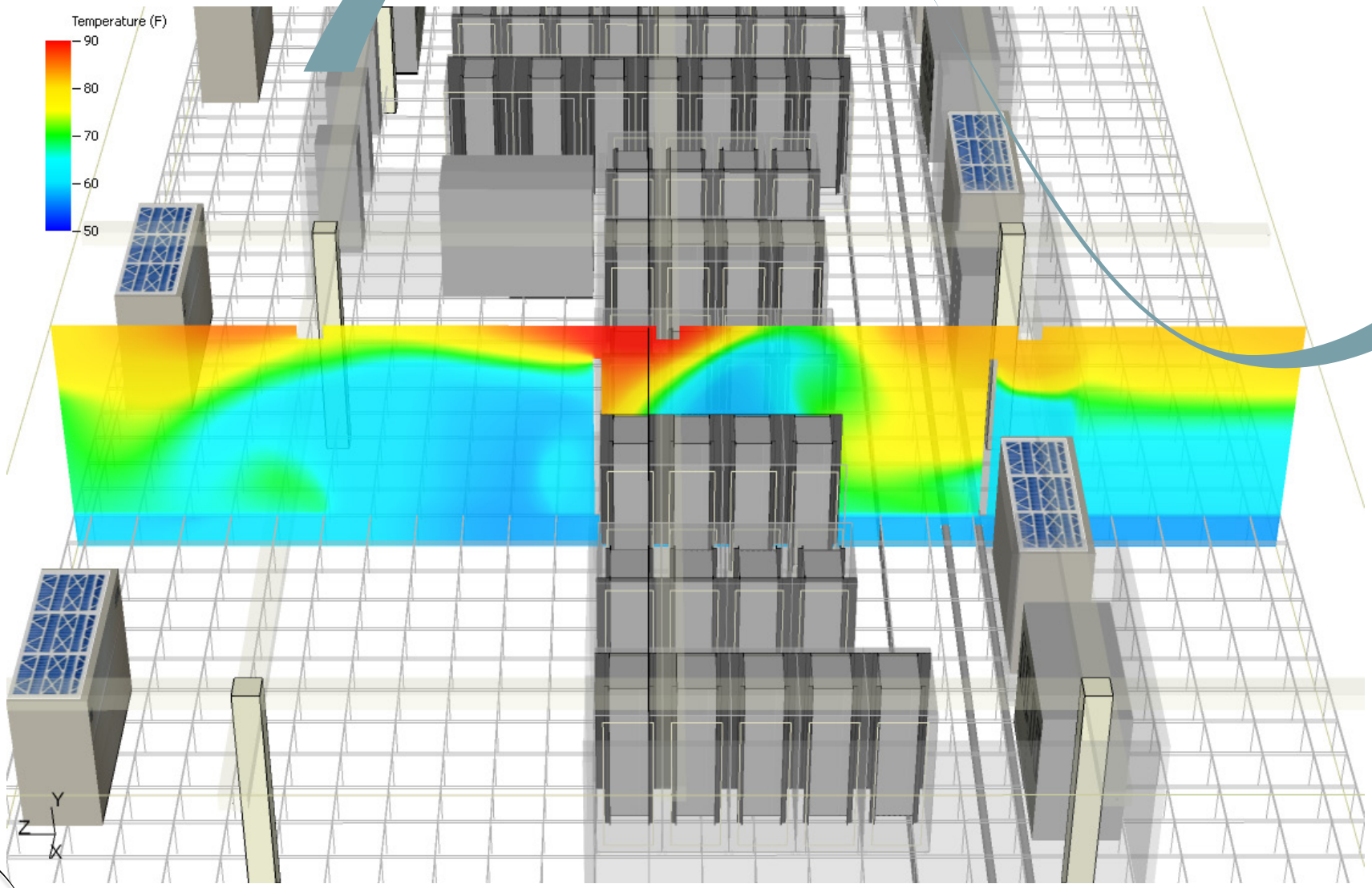
# Design Experience

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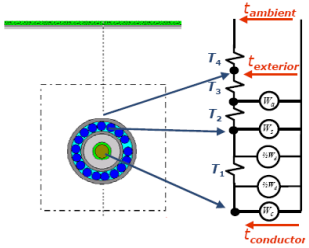
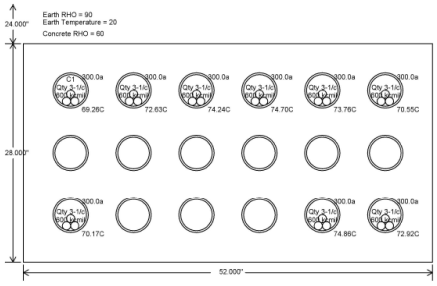
## Design

Underground Duct banks




Thermal Electrical Equivalent



2,700 Ampere Duct bank

| Client | Location | Description | Tier | Raised Floor |
|---|---|---|---|---|
| CyrusOne | San Antonio, TX | Data Center | 3+ | 90,000 |
| CyrusOne | Houston, TX (Galleria) | Data Center | 3+ | 150,000 |
| CyrusOne | Houston, TX (Houston West) | Data Center | 3+ | 150,000 |
| Terremark | Miami, FL | Data Center | 3+ | 50,000 |
| Terremark | Miami, FL | New 10MW Generator Plant | 3+ | N/A |
| Terremark | Beltsville, MD | Data Center | 3+ | 10,000 |
| Terremark | Bogota, Colombia | Data Center | 3+ | 20,000 |
| Rentec | East Setauket, NY | Data Center | 3+ | 20,000 |
| Sterling Bank | New York, NY | Data Center | 3 | 1,500 |
| IBM | Iselin, NJ | Disaster Recovery | 3 | 30,000 |
| Cervalis, LLC | Totowa, NJ | Data Center | 4 | 50,000 |
| Cervalis, LLC | Wappingers Falls, NY | Data Center | 4 | 40,000 |

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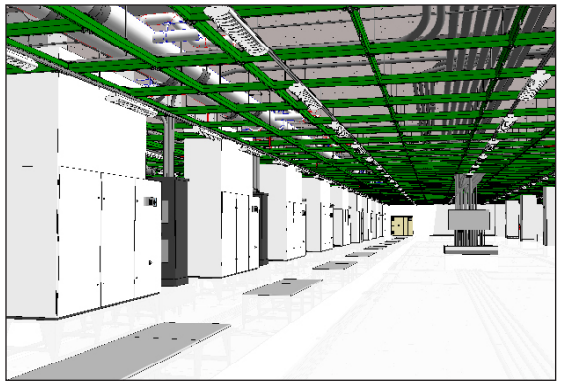

# Design

| Client | Location | Description | Tier | Raised Floor |
|---|---|---|---|---|
| Cervalis, LLC | Stamford, CT | Data Center | 4 | 22,000 |
| Discovery Communications | Miami, FL<br>Silver Spring, MD<br>Sterling, VA | Data Center | 3+ | 100,000 |
| CoreSite | Reston, VA | Data Center | 4 | 60,000 |
| CoreSite | New York, NY | Data Center | 3 | 43,000 |
| CoreSite | Boston, MA | Data Center | 4 | 20,000 |
| JPMC | New York, NY | Trading & Data Center | 4 | 45,000 |
| JPMC | Whippany, NJ | Data Center | 3+ | 60,000 |
| HSBC | New York, NY | Data Center & Trading Floor Upgrades | 3+ | 60,000 |
| Thomson Reuters | Hauppauge, NY | Data Center Expansion | 3 | 20,000 |
| Thomson Reuters | Valhalla, NY | Data Center | 3 | 20,000 |
| Citigroup | Stamford, CT | Data Center | 3 | 5,000 |

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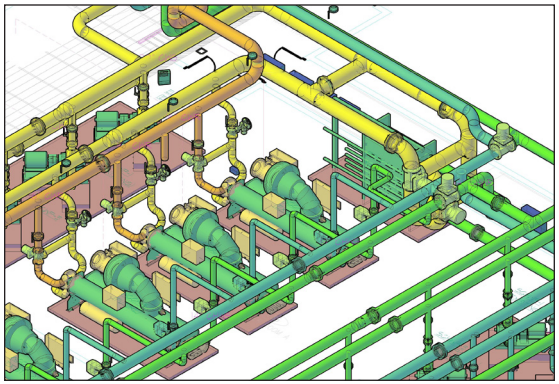

## Design

| Client | Location | Description | Tier | Raised Floor |
|---|---|---|---|---|
| Rentec | New York, NY | Trading & Data Center Upgrades | 3+ | 10,000 |
| Morgan Stanley | New York | Trading & Data Center | 3 | 75,000 |
| BlackRock | New York, NY | Data Center/ Trading Floor/ | 3 | 45,000 |
| Barclays Capital | Whippany, NJ | Trading Floor & | 3+ | 10,000 |
| Deutsche Bank | New York, NY | Trading Floor & Data Center | 3 | 125,000 |
| Wachovia/ Wells Fargo | Charlotte, NC | Data Center & Trading Floor | 4 | 150,000 |

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# Design
# Global Projects

| Client | Location | Description |
|---|---|---|
| Morgan Stanley | London, UK | Design Development documents for the 20,000 Sf Data Center and peer review of Construction Documents. |
| Morgan Stanley | Mexico | Branch office design development documents. |
| Morgan Stanley | Sao Paulo, Brazil | Evaluation of HVAC on trading floor. Preparation of design development documents and peer review of CD. Final punch list |
| Lehman Brothers | Tokyo | 250,000 sf. Performed Design Development for their Headquarter Relocation |
| NYMEX | London & Dubai | DD documents for both projects and working together with our affiliate in preparation of CD's |
| Commerzbank (formerly Dresdner Kleinwort Bank) | London, UK | Risk Assessment reviews of operational data centers |
| HSBC | Mexico City | Risk Assessment of operational data centers in Toluca and Chapultepec |
| Blackstone | Hong Kong | Provided consultation for their branch office to comply with Blackstone Standards |
| Terremark | Bogota, Colombia | Tier 3+, 20,000 sf Data Center expansion |

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# Commissioning Services

RDMC believes in a “Full Cycle” reliability assurance program that starts with design reviews and factory testing and ends with integrated systems testing at the site, operator training and a review of IO&M documents. The goal is to assure that the site infrastructure meets intended performance targets established in the design criteria. RDMC works as a partner driven to meet the owner’s project goals and uses a staff that is solely committed to the commissioning of critical site infrastructures.

A summary of RDMC commissioning services is as follows:

- Design Review
- Level 1 - Factory Testing
- Level 2 - Component Verification
- Level 3 - Vendor Startup
- Level 4 - Functional Testing
- Level 5 - Integrated Systems Testing
- Operator Training
- Installation, Operation and Maintenance Manual Review
- Forensic Evaluations
- LEED Fundamental and Enhanced Commissioning
- Infrared Surveys
- Power Quality and Disturbance Analysis

RDMC believes in the “take charge” role when engaged as the commissioning agent. We prepare a commissioning plan that identifies roles and responsibility as well as schedule. RDMC holds regular meetings with the project team to review scope of work, commissioning procedures, roles and schedule and publishes minutes of meetings.

When detailed commissioning begins, all hands meetings are held to review the activities planned for the day and progress reports are published daily. Items in need of repair and re-test are presented in spreadsheet format. A final report is prepared upon completion of commissioning activities. RDMC’s team of commissioning experts also ensure that operator training is conducted and closeout documentation such as IO&M manuals are completed.

Often times we learn about product safety bulletins or field change notices issued by vendor’s long before most clients are notified. We notify our clients immediately when we learn of these and work with them to remediate the condition at their site.

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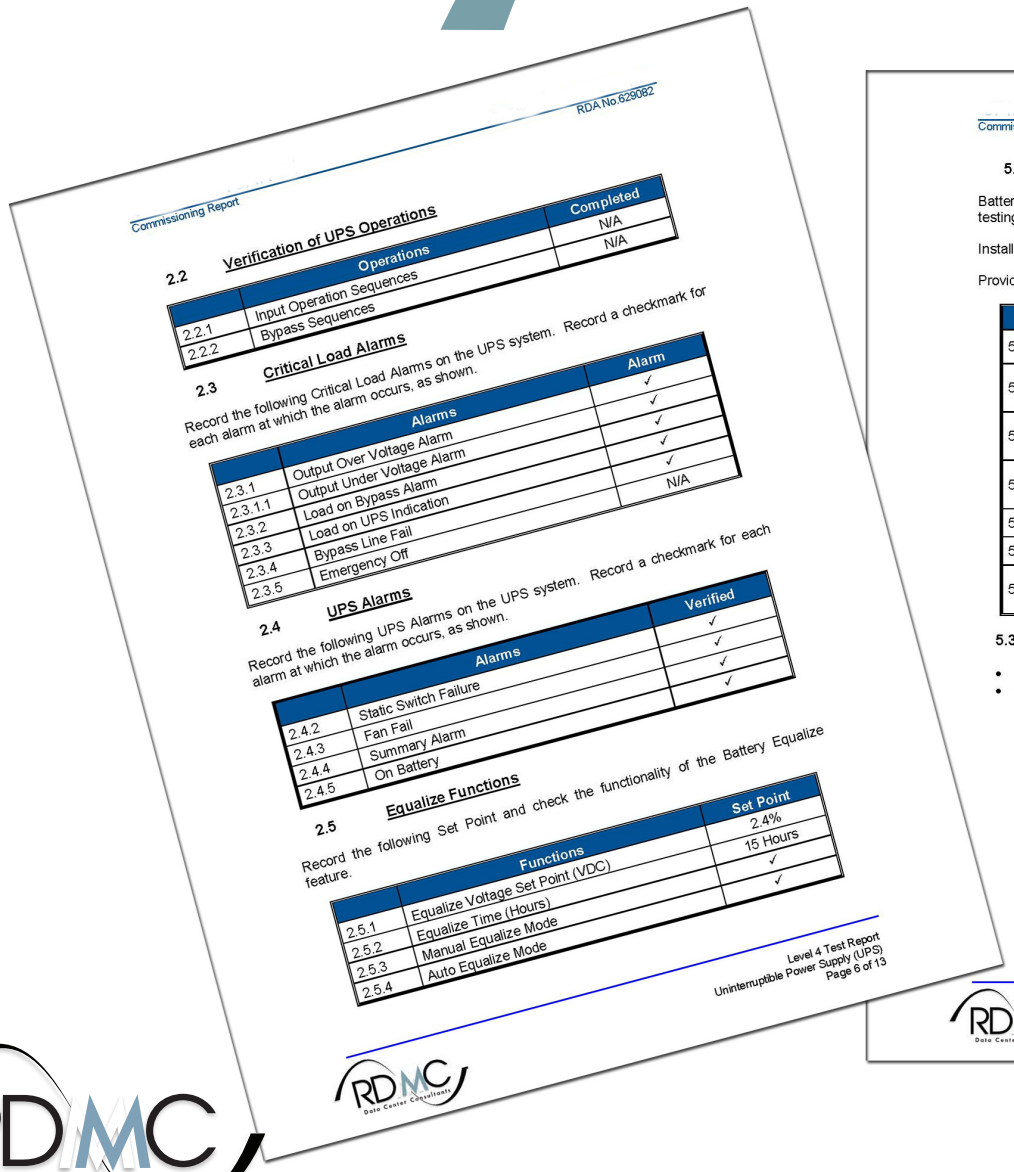
# Commissioning Experience



Commissioning Report RDA No.629082

**2.2 Verification of UPS Operations**

| | Operations | Completed |
|---|---|---|
| 2.2.1 | Input Operation Sequences | N/A |
| 2.2.2 | Bypass Sequences | N/A |

**2.3 Critical Load Alarms**

Record the following Critical Load Alarms on the UPS system. Record a checkmark for each alarm at which the alarm occurs, as shown.

| | Alarms | Alarm |
|---|---|---|
| 2.3.1 | Output Over Voltage Alarm | ✓ |
| 2.3.1.1 | Output Under Voltage Alarm | ✓ |
| 2.3.2 | Load on Bypass Alarm | ✓ |
| 2.3.3 | Load on UPS Indication | ✓ |
| 2.3.4 | Bypass Line Fail | ✓ |
| 2.3.5 | Emergency Off | N/A |

**2.4 UPS Alarms**

Record the following UPS Alarms on the UPS system. Record a checkmark for each alarm at which the alarm occurs, as shown.

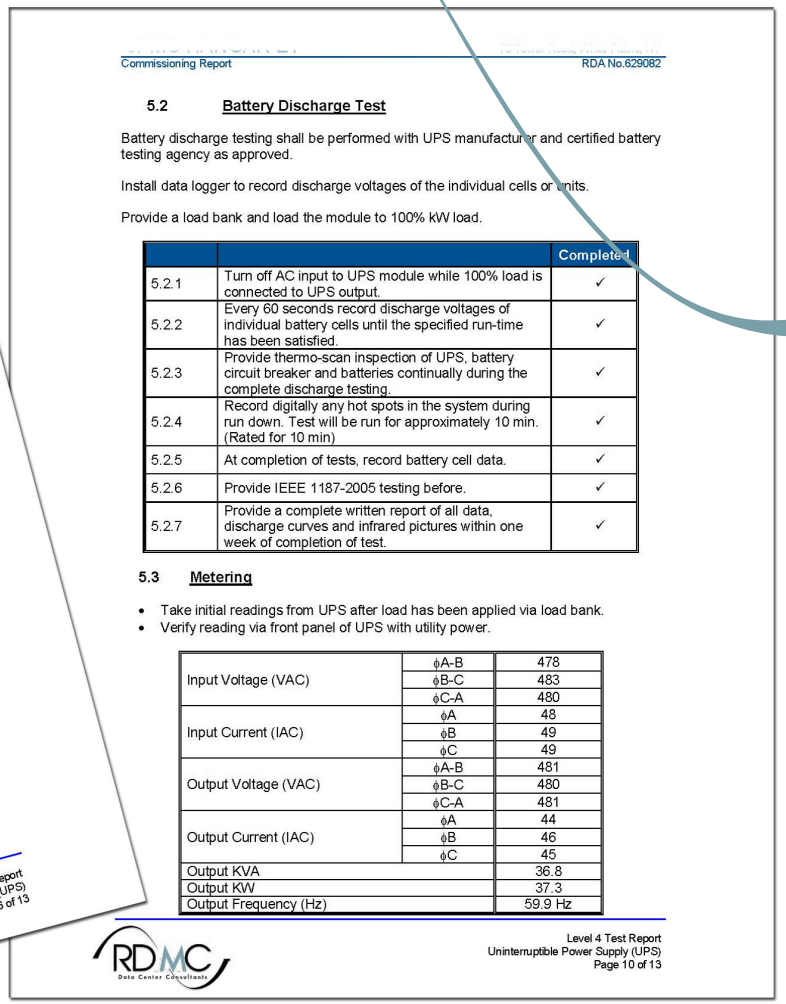
| | Alarms | Verified |
|---|---|---|
| 2.4.2 | Static Switch Failure | ✓ |
| 2.4.3 | Fan Fail | ✓ |
| 2.4.4 | Summary Alarm | ✓ |
| 2.4.5 | On Battery | ✓ |

**2.5 Equalize Functions**

Record the following Set Point and check the functionality of the Battery Equalize feature.

| | Functions | Set Point |
|---|---|---|
| 2.5.1 | Equalize Voltage Set Point (VDC) | 2.4% |
| 2.5.2 | Equalize Time (Hours) | 15 Hours |
| 2.5.3 | Manual Equalize Mode | ✓ |
| 2.5.4 | Auto Equalize Mode | ✓ |

Level 4 Test Report
Uninterruptible Power Supply (UPS)
Page 6 of 13



Commissioning Report RDA No.629082

**5.2 Battery Discharge Test**

Battery discharge testing shall be performed with UPS manufacturer and certified battery testing agency as approved.

Install data logger to record discharge voltages of the individual cells or units.

Provide a load bank and load the module to 100% kW load.

| | | Completed |
|---|---|---|
| 5.2.1 | Turn off AC input to UPS module while 100% load is connected to UPS output. | ✓ |
| 5.2.2 | Every 60 seconds record discharge voltages of individual battery cells until the specified run-time has been satisfied. | ✓ |
| 5.2.3 | Provide thermo-scan inspection of UPS, battery circuit breaker and batteries continually during the complete discharge testing. | ✓ |
| 5.2.4 | Record digitally any hot spots in the system during run down. Test will be run for approximately 10 min. (Rated for 10 min) | ✓ |
| 5.2.5 | At completion of tests, record battery cell data. | ✓ |
| 5.2.6 | Provide IEEE 1187-2005 testing before. | ✓ |
| 5.2.7 | Provide a complete written report of all data, discharge curves and infrared pictures within one week of completion of test. | ✓ |

**5.3 Metering**

- Take initial readings from UPS after load has been applied via load bank.
- Verify reading via front panel of UPS with utility power.

| | | |
|---|---|---|
| Input Voltage (VAC) | ϕA-B | 478 |
| | ϕB-C | 483 |
| | ϕC-A | 480 |
| Input Current (IAC) | ϕA | 48 |
| | ϕB | 49 |
| | ϕC | 49 |
| Output Voltage (VAC) | ϕA-B | 481 |
| | ϕB-C | 480 |
| | ϕC-A | 481 |
| Output Current (IAC) | ϕA | 44 |
| | ϕB | 46 |
| | ϕC | 45 |
| Output KVA | | 36.8 |
| Output KW | | 37.3 |
| Output Frequency (Hz) | | 59.9 Hz |

Level 4 Test Report
Uninterruptible Power Supply (UPS)
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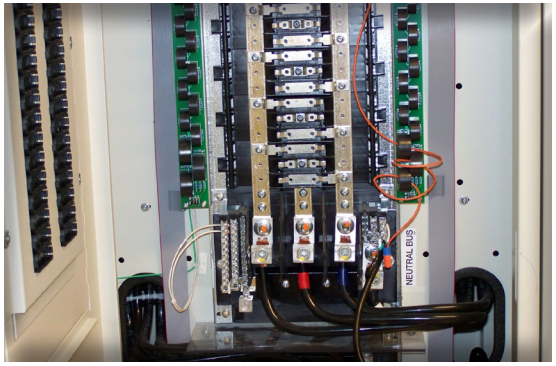


Commissioning of branch circuit monitoring

# Commissioning

| Client | Location | Description |
|---|---|---|
| CyrusOne | Carrollton, TX | Tier III+ Data Center Commissioning |
| CyrusOne | Lewisville, TX | Tier III+ Data Center Commissioning |
| American International Group | Fort Worth, TX | Tier III+ Data Center Commissioning |
| Terremark | Bogota, Colombia | Tier III+ Data Center Commissioning Services |
| JPMorgan Chase | New York, NY | Critical Systems Commissioning Services |
| Bear Stearns & Co. | New York, NY | Commissioning Services for Computer Room Build-out Commissioning of 4x750KVA UPS Expansion |
| Bear Stearns & Co. | Whippany, NJ | Commissioning of UPS, CRAC's, ASTS's and PDU's for various Computer Room expansions, solar generator and mechanical systems. Commissioning of Portable 3x2MW Diesel Generator & ATS Plant. |
| Black Rock | New York, NY | 200,000 SF Corporate Offices with 100 trading positions and supporting Comms Room. Commissioning of all critical systems. |
| Credit Suisse | Princeton, NJ | Commissioning Service for Computer Room |
| Credit Suisse | New York, NY | Ground-Up Computer Room + Supporting Infrastructure. Commissioning of all critical systems for Tier IV Data Center. |
| Ernst & Young | Secaucus, NJ | Tier IV 35,000 SF Corporate Data Center. Commissioning of all critical systems. |

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Computer Room Validation

# Commissioning

| Client | Location | Description |
|---|---|---|
| Fidelity | New York, NY | Commissioning of all critical systems for Data Center and Trading Floor |
| Morgan Stanley | New York, NY | Managed change-out and commissioning following AC/DC Capacitor and Fan Assembly Replacement. |
| Morgan Stanley | New York, NY | 22 floor high-rise building with Tier III 20,000 SF Data Center and support space, Trading Floor and General Office space. Commissioning of building management system (BMS) |
| Citigroup<br>Stamford, CT | Stamford, CT | Tier IV design and commissioning of re-configured existing Data Center to a Tier IV facility. Systems designed and commissioned. |
| JPMorgan Chase | New York, NY | MEP Plant Upgrades<br>Chillers, Generators, Switchgear and AHU systems enhancements. |
| Barr Labs | Montvale, NJ | Tier II 3500 SF<br>Data Center office space.<br>Data Center Commissioning.<br>Commissioning of all critical systems. |
| Cervalis Internet Services & Solutions | Wappinger Falls, NY | Tier III+ 100,000 SF Data Centers Commissioning of all critical systems. |
| Cervalis Internet Services & Solutions | Stamford, CT | Tier IV 100,000 SF Data Centers Commissioning of all critical systems. |
| Coresite | Reston, VA | Tier III+ 30,000 SF Computer Room – Phase I<br>15.5 MW N+1 Generator Plant, 2,000 Ton Chiller Plant 7MW UPS Plant at 2N, 160-175 w/SF |
| Coresite | New York, NY | 65,000 SF<br>Tier III+, 6.5 MW N+1 Generator Plant 2.7 MW UPS, 1,100 Tons A/C, 142 W/SF. Data Center, High Rise Environment |

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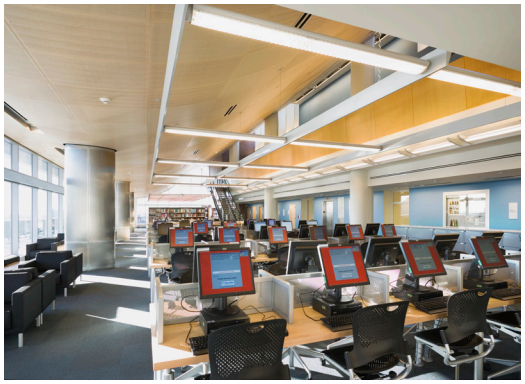

# LEED Commissioning

"Reduce our energy footprint and consumption."

| Client | Location | Description |
|---|---|---|
| Proskauer Rose LLP | New York, NY | Fundamental Commissioning for interior office space, LEED® Gold certified. |
| Morgan Stanley | New York, NY | Fundamental Commissioning for interior office space, LEED® Gold certified. |
| Wells Fargo/ Duke Energy Center | Charlotte, NC | This is a new building consisting of approximately one million square feet. Innovative design initiatives include under floor air distribution, rainwater harvesting and daylight harvesting among other sustainable features. Energy efficient lights with perimeter zone dimming are also being specified. This project is registered with the certification goal of Platinum Rating. |
| New York Public Library | Bronx, NY | This project involved constructing a brand new building consisting of approximately 78,000 square feet. Key mechanical features included air cooled chillers, gas fired boilers and a microprocessor based direct digital control system. The project, which was completed at the end of 2005, is LEED® Silver certified. |
| Pricewaterhouse Coopers | New York, NY | 132,000 square foot general Office renovation with overhead fan powered boxes, fan coil units, computer room ac units, existing BMS upgrades and new lighting controls. |

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*"The LEED® green building certification program is the nationally accepted benchmark for the design, construction, and operation of green buildings."*

## Mark Welte, PE
Partner

Mark Welte has 24 years of experience in the evaluation, design and planning of high availability sites for financial, technology, broadcasting and telecommunications industries. Mark's specialty is conducting grassroots reliability evaluations of 24x7 facilities and then leading multi-discipline teams of engineers and architects to integrate these requirements in the facilities infrastructure to achieve an enhanced level of resiliency.

He is a strong believer in linking simple but effective design with operations. Mark also manages large projects and multi-discipline teams of engineers and architects to integrate cohesive designs that above all support our client's 100% uptime goals. He has been a design leader on over 500,000 SF of raised floor space for various Data Center sites that include 100-180 million dollar Greenfield's and major renovations.

He has authored articles in Power Quality Assurance and EC&M magazines and is an active member of the 24x7 Exchange, Data Center Dynamics, IEEE, EGSA and other professional societies. Mark is an active speaker at 24x7 Exchange and Data Center Dynamics and was the co-developer of new mission critical circuit breaker intended for PDU's and RPP's that broke barriers by achieving selective coordination between main and branch breakers.

Mark has a BSEE from the University of Pittsburgh and an MSEE in Power Systems Analysis from Brooklyn Polytechnic University.

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## Daniel A. Braatz, PE, LEED AP ID+C

### Senior Associate

Dan Braatz has 20 years of experience in the evaluation, design and planning of high availability 24x7 facilities. Dan is a specialist in the design of complex HVAC systems with extensive experience in the overall design of central mechanical and chiller plants as well as high-rise office buildings with a concentration in telecommunication and data centers.

His Data Center experience has encompassed banks, outsourced data room spaces, major switching stations and private asset management firms. He has been the lead mechanical designer on projects over 500,000 SF of raised floor for various Data Center sites that include 100-180 million dollar Greenfield's and major renovations.

Dan is a registered engineer in New York, Connecticut and Pennsylvania and is also LEED Accredited. He received a BS in Mechanical Engineering from Manhattan College in Riverdale, NY.

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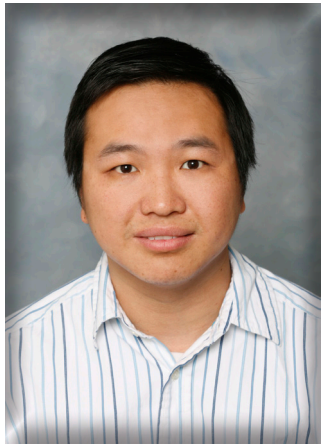

## Alan Loi
### Associate

Alan is an experienced Electrical Engineer who specializes in electrical design for Data Center and Trading Floors.  He has worked on various projects for clients such as Morgan Stanley (including on-call services), NATIXIS, Limited Brands, Deutsche Bank, Ernst & Young, Fidelity and Newsweek.

With a growing demand for reliable electric power, Alan is often called upon for his creative design solutions for various power systems including low and medium voltage utility distribution systems, on-site standby and cogeneration power systems and uninterruptible power supplies.

Alan is a young and dynamic team player who works aggressively to find cost effective solutions to hi-tech problems in a timely manner.

In addition to designing large scale systems, Alan is also proficient in managing and executing smaller projects in which meticulous attention to detail is required at an accelerated schedule.
Alan received a Bachelor of Science in Electrical Engineering from New York City Technical College.

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## Vincent Fama
### Associate

Vincent Fama has over 10 years of experience in the mission critical industry with the engineering design and project management of high level, highly reliable critical infrastructures for financial companies, technology, broadcasting and telecommunication companies across the country. Vincent's transcending approach to detail-oriented designs, from beginning to end, is what he prides himself in.

Several of his past and recent project experiences include the 100,000sf of Greenfield data center for Morgan Stanley in New Jersey, the 20,000sf build-out of new trading floor and infrastructure upgrades for RBS Greenwich Capital in Greenwich CT, the data center expansion and infrastructure upgrades for Avon Products in Rye NY, the medium voltage infrastructure upgrade for General Electric Executive Learning Center in Crotonville, NY, the data center and infrastructure upgrades for multiple web hosting facilities for AT&T in NY & NJ, the modernization of co-location facilities for Coresite in Reston, VA and Boston, MA, and Renaissance Technologies new data center facility in East Setauket, NY.

Vincent has a BSEE from Manhattan College in Riverdale NY.

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## Marko Ruljanovic, PE, LEED AP ID+C
Associate

With ten years of extensive mechanical engineering and construction management experience, Marko Ruljanovic is a motivated and goal-minded problem-solving member of the RDMC team. His wide experience ranges from critical facilities such as data centers, central plants and trading floors.

Marko's project management, execution of effective conceptual and detailed HVAC designs, quality control and commissioning expertise coupled with both architectural and engineering construction knowledge gives him the ability to look-ahead and avert conditions that may compromise schedule or the performance of the facility. His approach is the seamless integration of an entire project's scope.

Marko recently completed commissioning of critical infrastructure systems at JPMorgan's facilities at 383 Madison Avenue, Cervalis' Wappinger Falls and Stamford disaster recovery sites and data centers, and the market trading and computer room infrastructure for Morgan Stanley's 522 Fifth Avenue NYC. Currently, he is working on development of commissioning processes and procedures for Cervalis' greenfield data center which includes a large chiller plant and 50,000 SF data center white space.

He believes in a "hands-on" approach to his work and this includes frequent field observation, building relationships with the client and its project management staff, construction trades and resolving issues quickly so time and money are not lost. He also frequently performs CFD analysis for data centers and server rooms and performs in-the-field analysis and verification of the results.

Marko received a Bachelors of Engineering in Mechanical Engineering (BEME) from Stevens Institute of Technology.

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## Mike Letteri
### Commissioning

Mike Letteri has over twenty years experience in the design, construction, installation, testing and maintenance of critical systems including: power systems, environmental control systems, D.C. power plants, Stand-by generators and fire suppression systems. Mike has extensive knowledge of data center construction, electrical system operation, mechanical system operation and control system application.

Since joining RDA, Mike has provided on-site MEP engineering support on several very large critical facility construction projects and has completed commissioning projects for several large corporate data centers as well as many small and medium size critical installations. An experienced manager, he is familiar with all aspects of vendor management, cost accounting, facility management, facility evaluation and maintenance management.

Mike completed U.S. Navy Electrical Engineering training school and received a Bachelor of Science in Technology Management from Saint Leo College.

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# Advantage: RDMC

- Critical Sites are our passion. Greenfields and Retrofits.
- Partner Involvement - Aggressive Service
- Ability to Meet Aggressive Schedules
- Ability to Service Clients Across the Globe
- Ability to Balance Budget, Reliability and Efficiency Goals
- Independent Commissioning and Peer Review Team
- Memberships: ASHRAE TC9.9, USGBC, 7X24 Exchange, IEEE, Data Center Dynamics

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# Opportunity - Reducing Carbon Footprint

- DC Power Distribution to Technology
- Raise Cold Aisle Temperature
- High Efficiency UPS
- Air & Water Side Economizer
- ECM's on CRAC Fans
- Hot Aisle Containment
- Utilize Ceiling for Return Air
- Eliminate Reheat in CRAC's
- Eliminate PDU's
- High Efficiency 575 Volt Distribution
- Automated Lighting Controls
- Utilize Central Humidification
- Chilled Water Ice Storage

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# ROBERT DERECTOR
# MISSION CRITICAL


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