

## 1 Expert Profile

PHILIP J. ISAAK, PE, P.Eng., DCDC, RCDD, SMIEEE



Philp Isaak, PE, P.Eng., DCDC, RCDD, SMIEEE is a senior engineer and President of Isaak Technologies, Inc. Mr. Isaak is an electrical, network and data center infrastructure engineer, program and project manager with over 20 years of engineering experience. Phil has provided data center design and operations consulting or training to clients located in 28 countries and territories across 6 continents. Phil's engineering experience encompasses data center facilities, network infrastructure, IT platforms, Enterprise, Edge, Outsourced and Cloud data center services. He received his B.S. Electrical Engineering degree from the University of Manitoba, and his Data Center Design Consultant and Registered Communications Distribution Designer designations from the Building Industry Consulting Service International organization.

## 1.1 Degrees, Licenses and Designations

### Bachelor of Science in Engineering, Electrical

University of Manitoba, Winnipeg, Manitoba, Canada

May 29, 1996

### Professional Engineer (P.Eng.)

Province of Manitoba<sup>1</sup>: License #20893

August 31, 2000 to present

### Professional Engineer (PE)

State of Arizona<sup>2</sup>: License #43745

December 20, 2005 to present

### Registered Communications Distribution Designer (RCDD)

Building Industry Consulting Service International (BICSI)<sup>3</sup>: Registration #142698

October 27, 1997 to present

### Data Center Design Consultant (DCDC)

Building Industry Consulting Service International (BICSI)<sup>3</sup>: Registration #201045D

September 19, 2011 to present

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<sup>1</sup> <http://www.apegm.mb.ca/Directory.html>

<sup>2</sup> <https://azbtrprod.glsuite.us/GLSuiteWeb/Clients/AZBTR/Public/RegistrantRosterSearch/RegistrantRosterSearch.aspx>

<sup>3</sup> <https://www.bicsi.org/forms/Verify/CredentialHolder/>

## 1.2 Awards and Recognition

### Institute of Electrical and Electronic Engineers (IEEE)

In recognition of professional standing the Officers and Board of Directors of the IEEE certify that Philip Isaak has been elected to the grade of Senior Member (SMIEEE). (2016)

A not-for-profit organization, IEEE is the world's largest professional association for the advancement of technology. Only 9% of IEEE's approximately 428,000 members hold this grade, which requires extensive experience, and reflects professional maturity and documented achievements of significance.

### The Green Grid

The Recognition of Contribution Award has been issued to Phil Isaak for his contributions to the data center industry whitepaper, WP#72 ICT Capacity and Utilization Metrics, published by The Green Grid. (2017)

The Green Grid Association is a non-profit, open industry consortium of information and communications technology (ICT) industry end-users, policymakers, technology providers, facility architects, and utility companies that works to improve IT and data center resource efficiency around the world. The Green Grid offers the data center expertise that governments turn to for industry insight and counsel, bringing to bear the combined influence of a diverse body of ICT industry leaders.

### 1.3 Present Positions

Owner, President

Isaak Technologies, Inc. (2011 to present)

Co-Editor, ISO/IEC 22237-3, Data Centre Facilities and Infrastructures Part 3: Power Distribution

International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC), ISO/IEC JTC 1 / SC 39 Sustainability for and by Information Technology (2018 to present)

Chair, BICSI Data Center Operations Standard Subcommittee

Building Industry Consulting Service International (BICSI), (2015 to present)

Chair, Author and Editor of BICSI Standards subcommittee responsible for developing the ANSI/BICSI 009 Data Center Operations Standard

Member, BICSI Data Center Design Standard Subcommittee

Building Industry Consulting Service International (BICSI), (2004 to present)

Author and Editor of BICSI Standards subcommittee responsible for developing the ANSI/BICSI 002 Data Center Design Standard

Member, AR#16-001 Open Standard for Data Center Availability

The Green Grid, Global Technical Committee (2016 to present)

Co-developer of Open Standard for Data Center Availability (OSDA) tool algorithms

Member, AR#17-003 Data Center Infrastructure Usage Effectiveness

The Green Grid, Global Technical Committee (2017 to present)

Co-developing Infrastructure Usage Effectiveness (IUE) metric to address space, power, cooling and network utilization vs capacity

Member, International Committee for Information Technology Standards (INCITS)

ITS39 IT Sustainability, USA Technical Advisory Group (TAG) to ISO/IEC JTC 1 / SC 39 (2018 to present)

Expert, International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC), ISO/IEC JTC 1 / SC 39 Sustainability for and by Information Technology (2018 to present)

- Work Group 1
  - ISO/IEC 21836, Data Centres – Server Energy Effectiveness Metric
  - ISO/IEC 21897, Data Centres - Methods and tools to assess and express energy production, storage and consumption at data centre level in reference to primary energy
  - ISO/IEC 23050, Data Centres - Impact on data centre resource metrics of electrical energy storage and export
  - ISO/IEC 30134-x, Data Centres – Carbon Usage Effectiveness (CUE)
  - ISO/IEC 30134-x, Data Centres – Water Usage Effectiveness (WUE)
- Work Group 3
  - ISO/IEC 22237-1, Data Centre Facilities and Infrastructures  
Part 1: General Concepts
  - ISO/IEC 22237-3, Data Centre Facilities and Infrastructures  
Part 3: Power Distribution
  - ISO/IEC 22237-4, Data Centre Facilities and Infrastructures  
Part 4: Environmental Control
  - ISO/IEC 22237-50, Data Centre Facilities and Infrastructures  
Part 50: Earthquake risk and impact analysis

#### 1.4 Past Positions

Chair, AR#17-002 Power Metrics for ITE, Whitepaper #76

The Green Grid, Power Work Group (2017)

Managing Principal, Senior Electrical & Network Infrastructure Engineer,

Reliable Resources (2010 to 2011)

Principal, Senior Electrical & Network Infrastructure Engineer,

Reliable Resources (2004 to 2010)

Associate, Manager of Communications Engineering,

Mazzetti & Associates (2003 to 2004)

Telecommunications/Technology Project Manager,

Arden Technologies International (2002 to 2003)

Member, TIA TR-42 Telecommunications Cabling Systems

Telecommunications Industry Association (TIA), (2001 to 2002)

Author and Editor of TIA Standards committee responsible for developing the TIA-942

Telecommunications Infrastructure Standard for Data Centers

Electrical/Network Engineer,

Ellerbe Becket (1999 to 2002)

Electrical/Network Engineer,

Scouten, Mitchell, Sigurdson & Associates, Ltd (1996 to 1999)

## 1.5 Publications

### *Power Metrics for ITE, Whitepaper #76, 2017<sup>4</sup>*

The Green Grid

This paper describes the outcome of an initiative undertaken by The Green Grid in early 2017 (WI #17-002) to define a set of metrics that can quantify the power demand and energy consumed of ITE platforms within a data center. The ITE systems are defined as the compute processing, storage and network hardware within the data center. Trending the power demand over a multi-year timeframe can serve as a useful indicator for future capacity requirements (capital expenditures), while trending energy over a multi-year timeframe can serve as a useful indicator for future operational expenditures. Mr. Isaak wrote the Power Metrics for ITE data center industry whitepaper in collaboration with the other work group members.

### *Open Standard for Data Center Availability Tool, 2017<sup>5</sup>*

The Green Grid

The Open Standard for Datacenter Availability (OSDA) was kicked off by The Green Grid early in 2016 to create an availability classification and rating system that is intended to promote innovation in energy efficiency and sustainable designs of data centers. The published tool, currently only available to members of The Green Grid, allows users to compare data center designs using the OSDA scale. The OSDA score will give a relative comparison of designs and NOT an absolute value for availability and reliability. This is intentional, since predicting actual design performance is fraught with complexity and assumptions. Mr. Isaak co-developed the OSDA algorithms in collaboration with the other work group members.

### *ICT Capacity & Utilization Metrics, Whitepaper #72, 2017<sup>6</sup>*

The Green Grid

This white paper describes the outcome of an initiative undertaken by The Green Grid in early 2015 to define a metric or set of metrics that can quantify the maximum volume of information and communications technology (ICT) services that can be delivered by a data center for a given investment (“ICT capacity”) and provide an indicator of the share of that capacity that is actually utilized (“ICT utilization”). Mr. Isaak co-wrote the ICT Capacity & Utilization Metrics data center industry whitepaper in collaboration with the other work group members.

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<sup>4</sup> <https://www.thegreengrid.org/en/resources/library-and-tools/467-WP#76---Power-Metrics-for-ITE>

<sup>5</sup> <https://www.thegreengrid.org/en/resources/library-and-tools/460-Open-Standard-for-Datacenter-Availability-Tool>

<sup>6</sup> <https://www.thegreengrid.org/en/resources/library-and-tools/436-WP#72---ICT-Capacity-and-Utilization-Metrics>

*Data Center Design & Implementation Best Practices standard, BICSI 002, first published in 2010 ed<sup>7</sup>, latest publication 2014 ed<sup>8</sup>*

Mr. Isaak authored or co-authored the original content listed below that was initially published in the ANIS/BICSI 002 Data Center standard. Mr. Isaak continues to work within the ANSI/BICSI 002 standard committee, editing content or providing new content to be included in future editions.

<b>Section</b>	<b>Title</b>
Section 1	Introduction
Section 5	Site Selection
Section 6	Space Planning
Section 9	Electrical Systems
Section 10	Mechanical
Section 14	Telecommunications Cabling, Infrastructure, Pathways and Spaces
Section 15	Information Technology
Appendix A	Design Process
Appendix B	Reliability and Availability
Appendix C	Alignment of Data Center Services Reliability with Application and System Architecture
Appendix D	Data Center Outsourcing Models
Appendix E	Multi-Data Center Architecture

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<sup>7</sup> [https://web.archive.org/web/20101229021341/https://www.bicsi.org/book\\_details.aspx?Book=BICSI-002-CD-v2&d=0](https://web.archive.org/web/20101229021341/https://www.bicsi.org/book_details.aspx?Book=BICSI-002-CD-v2&d=0)

<sup>8</sup> [https://www.bicsi.org/book\\_details.aspx?Book=BICSI-002-CM-14-v5](https://www.bicsi.org/book_details.aspx?Book=BICSI-002-CM-14-v5)



*Data Center Handbook*, John Wiley & Sons, Inc., Hoboken, NJ, 2014, pp.163-181<sup>9</sup>

The Data Center Handbook is a collective representation of an international community with scientists and professionals from eight countries around the world. Fifty-one authors, from data center industry, R&D, and academia, plus fifteen members at Technical Advisory Board have contributed to this book.

The Data Center Handbook instructs readers to:

- Prepare strategic plan that includes location plan, site selection, roadmap and capacity planning
- Design and build "green" data centers, with mission critical and energy-efficient infrastructure
- Apply best practices to reduce energy consumption and carbon emissions
- Apply IT technologies such as cloud and virtualization
- Manage data centers in order to sustain operations with minimum costs
- Prepare and practice disaster recovery and business continuity plan

The book imparts essential knowledge needed to implement data center design and construction, apply IT technologies, and continually improve data center operations. The specific section authored by Mr. Isaak is Chapter 9, Architecture Design: Data Center Rack Floor Plan and Facility Layout Design.

*Telecommunications Infrastructure Standard for Data Centers, TIA-942*, 2005 ed<sup>10</sup>  
Telecommunications Industry Association (TIA)

This TIA-942 Standard specifies the minimum requirements for telecommunications infrastructure of data centers and computer rooms including single tenant enterprise data centers and multi-tenant Internet hosting data centers. Mr. Isaak was one of six editors who co-wrote the standard along with other members of the TR42 Engineering Committee.

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<sup>9</sup> <https://www.wiley.com/en-us/Data+Center+Handbook-p-9781118937570>

<sup>10</sup> [https://global.ihs.com/doc\\_detail.cfm?&csf=TIA&item\\_s\\_key=00414811&item\\_key\\_date=960613&input\\_doc\\_number=TIA%2D942&input\\_doc\\_title=#abstract](https://global.ihs.com/doc_detail.cfm?&csf=TIA&item_s_key=00414811&item_key_date=960613&input_doc_number=TIA%2D942&input_doc_title=#abstract)

## 1.6 Presentations

### **Expert Panel – Edge Data Centers, An Alternative to the Vulnerabilities of the Cloud**

Co-panelists – Schneider Electric/APC, Cisco, Huawei, GBM

Data Center Summit Conference, San Jose, Costa Rica, August 9, 2018

Data Center Consultores

### **Expert Panel - Characterizations of Green Data Center Hubs**

Co-panelists – United States Green Building Counsel, EPI, ICE

Data Center Summit Conference, San Jose, Costa Rica, August 9, 2018

Data Center Consultores

### **Edge Data Centers - Where is the Edge? What does it Look Like?**

Data Center Summit Conference, San Jose, Costa Rica, August 9, 2018

Data Center Consultores

### **Panel Discussion - Impact of Standards on Data Center & Building Facilities**

Consultants Forum, Marrakesh, Morocco, September 18, 2017

Panduit Corporation

### **Standards and the Future of the Data Center**

Consultants Forum, Marrakesh, Morocco, September 18, 2017

Panduit Corporation

### **Who's in Charge - Data Center Network Architecture, Topology or Infrastructure**

Consultants Forum, Marrakesh, Morocco, September 18, 2017

Panduit Corporation

### **How Data Center IT and Facility Operations Can Improve Energy Efficiency**

Data Center Summit Conference, San Jose, Costa Rica, August 10, 2017

Data Center Consultores

### **Applying ICT Capacity and Utilization Metrics to Improve Data Center Efficiency**

Global Member and Non-Member Webinar, March 16, 2017

The Green Grid

### **BAS-BMS-DCIM-CMMS-CFD: What Are We Supposed to Measure and How Do We Measure It**

Data Center Summit Conference, San Jose, Costa Rica, August 30, 2016

Data Center Consultores

### **Data Center Disaster Recovery Site Selection**

Data Center 1-day Seminar, San Jose, Costa Rica, December 11, 2015

Data Center Consultores

### **Expert Panel, Cloud Services for the World**

Data Center Summit Conference, San Jose, Costa Rica, August 18, 2015

Data Center Consultores

### **Data Center Operations and Maintenance**

Data Center Summit Conference, San Jose, Costa Rica, August 18, 2015

Data Center 1-day Seminar, San Jose, Costa Rica, June 11, 2015

Data Center Consultores

### **How to Ensure Your Design Will Meet the Future Demand of the Data Center**

BICSI Fall Conference and Exhibition, ½ Day Seminar, Anaheim, CA USA, September 29, 2014

Building Industry Consulting Service International (BICSI)

### **BICSI 002, TIA-942, Uptime – Which One to Use**

BICSI South East Asia Conference, Singapore, November 25, 2013

Building Industry Consulting Service International (BICSI)

### **Data Center Commissioning – Lessons Learned**

Data Center Summit Conference, San Jose, Costa Rica, October 22, 2013

Data Center Consultores

### **Building Best in Breed Data Centers – Cloud and Data Center Track**

The Future of the Network Conference, Washington, DC USA, October 10, 2013

Telecommunications Industry Association (TIA)

### **The Most Common Errors in the Design and Implementation of Data Centers & How to Avoid Them**

BICSI Central America & Latin America District Webinar, August 21, 2013

Building Industry Consulting Service International (BICSI)

### **ANSI/BICSI 002-2011 Data Center Design and Implementation Best Practices**

BICSI South East Asia District Board Meeting, Singapore, April 26, 2013

Building Industry Consulting Service International (BICSI)

### **Data Center Redundancy and Reliability, Analyzing the Facility and the Enterprise**

BICSI Canadian Conference and Exhibition, Niagara Falls, ON Canada, April 30, 2012

Building Industry Consulting Service International (BICSI)

### **Data Center Reliability – How Much is Needed & How to Validate You Got It**

Minnesota Chapter Meeting, Minneapolis, MN USA, August 10, 2012

Association for Computer Operations Managers (AFCOM)

**Data Center Services Reliability**

Interop “The Future of IT” Conference, New York, NY USA, October 6, 2011

**Expert Panel, Natural Disasters - Impact on Data Center Infrastructure and Telecommunications**

Data Center Summit Conference, San Jose, Costa Rica, August 30, 2011

Data Center Consultores

**ANSI/BICSI 002-2011 Data Center Design and Implementation Best Practices**

Data Center Summit Conference, San Jose, Costa Rica, August 29, 2011

**High Reliability in Data Center Design**

Data Center Summit Conference, San Jose, Costa Rica, August 29, 2011

Data Center Consultores

**Keynote Address - From the Server Closet to the Data Center**

Small Business Virtual Web Conference, October 21, 2010

Information Week / bMighty

**ANSI Standards - Beyond the Technology Life Cycle**

Data Center World Conference, Atlanta, GA USA, March 21, 2006

Association for Computer Operations Managers (AFCOM)

**Data Center Standards Review**

Data Center World Conference, Chicago, IL USA, October 11 and 12, 2005

Association for Computer Operations Managers (AFCOM)

**Ask the Experts Panel**

Data Center World Conference, Chicago, IL USA, October 12, 2005

Association for Computer Operations Managers (AFCOM)

**Mission Critical Operations – Trends and Best Practices**

Data Center World Conference, Las Vegas, NV USA, April 21, 2005

Association for Computer Operations Managers (AFCOM)

**Physical Constraints within Networking**

Masters in Telecommunications, Adjunct Instructor, February 20, 2004

Saint Mary’s University of Minnesota

**Design Best Practices for Critical Facilities**

The American Institute of Architects – Minnesota Chapter, Minneapolis, MN USA, May 16, 2000