Dodging Data Center Operations Disasters

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1000+ Certifications in over 80 Countries
Downtime happens...

• According to 2015 Survey Data: Nearly 50% of enterprise IT organizations experienced a business-impacting data center outage in their own data center during the previous 12 months.

• In 2016, one third of enterprise IT organizations experienced an outage from a colocation provider in the previous 12-month period.
Complex IT systems are prone to cascading failure

A single incident is not sufficient to bring down a robust system unless it is already teetering on the edge of failure and has multiple underlying risk factors left untended by management.
Outages due to “Human Error”?

Although operator error or single equipment failure may sometimes appear to cause an incident, a single incident is not sufficient to bring down a robust system unless conditions are such that the system is already teetering on the edge of critical failure and has multiple underlying risk factors left untended by management.
Conventional Wisdom is Wrong

• Conventional wisdom blames “human error” for the majority of outages: operator mistakes. The responsibility falls to the operator for failing to rescue a situation.

• But failure in most cases, can be attributed to poor management decisions (design compromises, budget cuts, staff reductions, vendor selection, a lack of appropriate procedures and resources) disconnected from the incident.

• What decisions led to a situation where front line operators were unprepared or untrained to respond to an incident and mishandled it?
Management & Operations Program:
Uptime Institute addresses the largest risk to data center availability
What causes data center outages?

• The majority of the reported data center outages tracked by the Uptime Institute are directly attributable to human error, not the infrastructure/design.

• Human Error includes operator error—but more importantly, speaks to management decisions regarding staffing levels, training, maintenance, and overall rigor of the operation.

• The greater the number of components and the greater the skill and teamwork required to plan, manage and operate the systems safely.
No standard existed to help data center executives assess operations

Management and Operations program provides:

• Common language/vocabulary of data center operations
• Focus of data center management
• Guidance for resource allocation and requirements
Data Center Operations Reviews

Uptime Institute has conducted Operational Sustainability and M&O Assessments since 2010—based upon decades of site operations knowledge and experience:

- Operational Sustainability Certifications: Tier + Gold, Silver, or Bronze
- Management & Operations (M&O) Stamp of Approval
A score-based system for evaluating operations:

— Better match site resiliency to IT workload criticality
— Standardize Quality of Service to end users
— Evaluate vendor performance
— Provide transparency to C-level stakeholders
Common Deficiencies

Typical Operations Shortfalls
Management and Operations Deficiencies

Percent of Behaviors Ineffective

Staffing | Maintenance | Training | Planning, Coordination & Mgt | Operating Conditions
--- | --- | --- | --- | ---
15.0% | 25.0% | 35.0% | 20.0% | 30.0%
Staffing and Organizational Deficiencies

**Staffing**
- Inadequate staffing
- Excessive overtime
- No escalation process

**Qualification**
- No list of required qualifications
- No experience with data center specific equipment

**Organization**
- Roles and responsibilities not documented
- Data center organization not integrated
Maintenance Findings

Preventive Maintenance (PM)
- No list of required PM activities
- PM activities not fully scripted
- No quality control process

Housekeeping
- Combustibles in data center
- No documented housekeeping policy

Maintenance Management System (MMS)
- No list of equipment
- Unable to produce deferred maintenance report from MMS
- Missing critical data: warranty info, maintenance history, performance data, etc
Management Deficiencies

Vendor Support
- Contracts missing response times, call-in process, detail SOW, or technician qualifications
- No briefing for escorted vendors

Analysis
- Failure Analysis: No record of outages or near misses
- No predictive maintenance program

Training
- No formal training program with lesson plans
- Undocumented On-the-Job (OJT) programs
- No list of training required by position
Operations Deficiencies

**Operating Conditions**
- Load Management Alarm settings not documented
- Alarms not set on PDUs to ensure maximum loads are not exceeded
- Cooling set points are not documented or part of Change Management Process
- Changing of set points is not controlled
- Ineffective management of Cold Aisles/Hot Aisles

**Documentation**
- Missing Site Policies
- Especially Site Configuration Policy
- No process for keeping reference library documents up-to-date

**Capacity Planning**
- No process for forecasting future space, power, and cooling requirements
- No active tracking of cooling capacity
- No lifecycle plan
M&O Program:
Provides management framework to address behaviors and risks—-independent of design
Review Process

• Review performed by Uptime Institute Professional Services
  — Vendor neutral
  — Delivered by senior professionals with actual data center experience

• Review based on Management and Operations Behaviors
  — Validating if the behavior exists
  — Determine if behavior is effective

• Review method includes
  — Reviewing documentation and historical records
  — Dialog with data center staff and observing activities in the data center
  — Encourages doing it ‘your way’—results oriented (behaviors, not requirements)
Key Elements of Facilities Management

• Staffing and Organization
  — Staffing
  — Qualifications
  — Organization

• Maintenance
  — Preventative Maintenance (PM) Program
  — Housekeeping Policies
  — Maintenance Management System (MMS)
  — Vendor Support
  — Deferred Maintenance Program
  — Predictive Maintenance
  — Life-Cycle Planning
  — Failure Analysis Program
Key Elements of Facilities Management

• Training
  — Data Center
  — Vendors

• Planning, Coordination, and Management
  — Site Policies
  — Financial Management
  — Reference Library
  — Computer Room Mgmt

• Operating Conditions
  — Load Management
  — Operating Set Points
  — Alternating Use of Infrastructure Equipment
M&O Candidate Attributes:

— Operational data center
— 24 x 7 uptime requirement
— Significant cost of downtime
— Not a Tier Certified Constructed Facility
— Commitment to excellence in operations
Over 100+ M&O Awarded Sites

UPTIME INSTITUTE APPROVED

M&O
Dubai International Financial Centre
Colocation Data Centre
Exp. 26 February 2018

UPTIME INSTITUTE APPROVED

M&O
Etisalat
Al Ain Data Center
Exp. 15 April 2018
Enterprise IT Assurance

• As cloud adoption continues, the end user has less control over the data center infrastructure than ever before. M&O provides third-party assurance that the underlying data center is operated to the customer’s performance requirements.

• Increasingly, enterprise companies are stipulating M&O Stamps of Approval in RFPs to data center service providers.

• Over 65% of enterprise IT departments use Uptime Institute's Tier Certification and M&O Stamp of Approval as part of the vetting process for considering potential colocation candidates, according to the 2016 Data Center Industry Survey.
"We sought a level of achievement to differentiate beyond what was expected or commonplace. Uptime Institute’s M&O Stamp of Approval requires a level of rigor and aptitude specific to data centers that digs into, and recognizes, our operational achievements.”

David Meredith
Senior Vice President
“This independent assessment (M&O Stamp of Approval) of RBC’s maintenance and operations processes ensures an objective evaluation. A testament that we are on the right track for best in class in the eyes of our peers and stakeholders.”

Stephan Abraitis, RPA, FMA
Senior Director, Global Critical Environments
M&O Customers

2016 SURVEY RESULTS
M&O Customer Survey Results

77% Said that Uptime Institute assessors and the comprehensiveness of M&O protocol was the highest quality and most rigorous amongst other data center operations assessments.
M&O Customer Survey Results

79% Stated that the organization will see a ROI for the M&O investment
M&O Customer Survey Results

80% Said M&O Assessment had a positive material impact on their business
M&O Customer Survey Results

86% Stated they would consider M&O as a way to align process and procedures across multiple data centers
M&O Customer Survey Results

100% Said the M&O Stamp of Approval improved their internal processes

*64% said profoundly
Outcomes

• Obtains third-party proof of operations/management quality of service being provided to the data center owner based on an industry-driven protocol

• Provides consistent delivery practices regardless of location across a portfolio.

• Provides market recognition and ability to compare across sites

• Validates the focus on those items that will most improve the performance of a data center

• Reinforces message of commitment to excellence in operations and uptime