

BOMA CHINA
ELEVATOR MAINTENANCE
AND INSPECTION PRESENTATION

BOMA中国专题演讲

电梯维护和检查

电梯维护和检查

Vertical Transportation Maintenance / Safety

垂直交通系统的维护与安全

From Three Points of View

Real Estate Owner / Manager

- Elevator Contractor
- Elevator Consultant

从三个角度进行介绍

房产业主/管理者

- 电梯承包商
- 电梯顾问

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What are the Major Motivating Factors? 主要驱动因素有哪些？

- **Codes** (Legislation, Regulation and Enforcement)
- **Legal System** (Liability)
- **Competition**
 - In the Real Estate Market
 - In the Vertical Transportation Market
- **Product Life-Cycles**

- 规范（法规、监管和执行）
- 法制（责任）
- 竞争
 - 地产行业竞争
 - 垂直交通行业竞争
- 产品生命周期

All serve to drive the quality of Design, Manufacture and Maintenance of VT Systems

一切均为推动VT（垂直交通）系统的设计、制造和维护的质量

Codes 规范

- National
 - Safety Code for Elevators and Escalators (ASME A17.1)
 - Design and Manufacture
 - Installation
 - Testing Protocols
 - Maintenance
 - Inspector's Manuals for Elevators and Escalators (ASME A17.2)
 - Traction (.1)
 - Hydraulic (.2)
 - Escalators and Moving Walks (.3)
 - Safety Code for Existing Elevators and Escalators (ASME A17.3)
 - Includes Retroactive Requirements
- 全国
 - 电梯和自动扶梯安全规范 (ASME A17.1)
 - 设计与制造
 - 安装
 - 测试协议
 - 保养
 - 电梯和自动扶梯检查员手册 (ASME A17.2)
 - 牵引 (.1)
 - 液压 (.2)
 - 自动扶梯和自动人行道 (.3)
 - 针对现有电梯和自动扶梯的安全规范 (ASME A17.3)
 - 包括追溯性要求

Codes 规范

- Local (“AHJ” – Authority Having Jurisdiction)
 - New York City Building Code (“BCNYC”)
 - “Appendix K” of BCNYC
 - Adopts National Code (A17.1)
 - Modifies National Code to Suit Local Needs and Conditions
 - “Appendix K-3” of BCNYC
 - Adopts A17.3
 - Modifies National Code to Suit Local Needs and Conditions
 - BCNYC Sections
 - Various Operational / Regulatory Rules

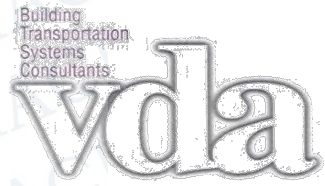
- 本地（“AHJ” - 监管当局）
 - 纽约市建筑规范（“BCNYC”）
 - BCNYC “附录K”
 - 使用国家规范（A17.1）
 - 修改国家规范，以满足当地需求和条件
 - BCNYC “附录K-3”
 - 使用A17.3
 - 修改国家规范，以满足当地需求和条件
 - BCNYC部分
 - 各种运营/管理规则

Regulation & Enforcement

监管和执行

- NYC Department of Buildings (DOB) has Some Inspectors
 - NYC DOB Inspectors Mostly Audit, Respond to Complaints or Accidents
 - Very Few DOB Inspectors Due to:
 - Low Salaries
 - Corruption
 - NYC DOB Licenses Private Inspectors
 - To Witness and Certify Periodic Tests and Inspections
 - To Perform Inspections on Behalf of NYC DOB (Subcontractors)
 - Government is Most Often Better at Policing and Enforcement than Management
- 纽约市楼宇局（DOB）有少量检查员
 - 纽约DOB检查员主要负责审核、回应投诉或事故
 - DOB检查员人数稀少，由于：
 - 工资低
 - 腐败
 - 纽约DOB授权的私人检查员
 - 见证和认证定期测试和检查
 - 代纽约市DOB执行检查（分包商）
 - 通常政府更擅长监管和执法而非管理

Regulation & Enforcement 监管和执行



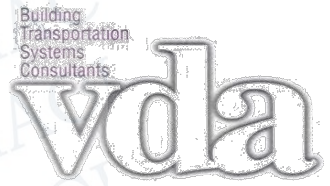
- **Tests and Inspections**

- BCNYC Mandates Periodic Tests and Inspections
 - Annually for All Elevators, Escalators and Moving Walks (“Category-1”)
 - Safety Electrical and Mechanical Devices Tested
 - Equipment Inspected
 - 5-Year Test for All Traction Elevators (“Category-5”)
 - 125% of Contract Load
 - Full Speed Deployment of Safety Devices
 - Full Speed Buffer Compression
 - Certain Failures Require “Red Tagging” of Equipment
 - Removal from Service and Report to DOB
 - Deficiencies Must be Reported and Corrected
 - Test Results / Deficiencies Certified and Filed with DOB
 - Affidavits of Correction Timely Filed with DOB

- **测试和检查**

- BCNYC授权定期测试和检查
 - 所有电梯、自动扶梯和自动人行道年检（“1类”）
 - 安全机电设备测试
 - 检查设备
 - 针对所有牵引电梯5年测试（“5类”）
 - 125%的合同负载
 - 安全装置的全速部署
 - 全速缓存压缩
 - 有些故障要求给设备打“红色标记”
 - 退出并报告DOB
 - 必须报告并更正缺陷
 - 认证测试结果/不足之处，并向DOB提交档案
 - 向DOB提交及时修正证明

Regulation & Enforcement 监管和执行



- **Enforcement**

- Violations Issued Against the Property
 - Easy Public Access to this Information
- Summonses and Fines May Result
- Obstruction of Certificate of Occupancy (“C of O”) Issuance
 - C of O requires a “Clean Slate”
- Obstruction of Transfer of Title

- **执行**

- 向物业发布违规通告
 - 确保公众可方便地获得相关信息
- 可能导致传票和罚款
- 阻止入住证（C of O）的发放
 - 入住证要求“历史清白”
- 阻止所有权转让

Legal System (Liability) 法制（责任）

THE CONCEPT OF LIABILITY (RESPONSIBILITY / NEGLIGENCE)

责任制概念（责任/渎职）

- The Manufacturer and/or Maintainer is Responsible
 - To Manufacture, Install and Maintain According to Codes
 - To Install and Maintain According to “Industry Standards”
 - **Not Doing So is Considered Negligence**
- 制造商及/或监护人负责
 - 制造商需按照规范进行安装和维护
 - 按“行业标准”进行安装和维护
 - **违反上述要求将被视为渎职**
- The Contractor “Holds Harmless” the Client, in Contract
 - “Indemnification” – What Does It Mean?
- 承包商在合同中“保证不伤害”客户
 - “赔偿”——这是什么意思？

Legal System (Liability) 法制（责任）

THE CONCEPT OF LIABILITY (RESPONSIBILITY / NEGLIGENCE)

责任概念（责任/渎职）

- Worker's Compensation
 - Protects the Employee to an Extent
 - Protects the Employer in Most Cases
- 劳动者补偿
 - 在一定程度上保护员工
 - 大多数情况下保护雇主
- Legal Costs are Extremely High and Are Always Increasing
 - Injury – Medical, Pain and Suffering
 - Damages – Lost Income / Opportunity
 - Possible Punitive Damages
- 法律成本非常高而且不断增加
 - 伤害 – 医疗、病痛
 - 损害 – 收入/机会损失
 - 可能导致惩罚性赔偿

Predominance of Major Manufacturers 主要制造商的优势

- Otis – USA (1853)
- 奥的斯 – 美国 (1853)
- Schindler – Switzerland (1874)
 - Includes Haughton – USA (1880) Acquired 1979
 - Includes Westinghouse – USA (1928) Acquired 1989
- 迅达 - 瑞士 (1874)
 - 包括霍顿 – 美国 (1880年) 1979年收购
 - 包括西屋 – 美国 (1928年) 1989年收购
- Thyssen Krupp – Germany (Founded as Stahl 1876)
 - Includes Dover – USA (1955) Acquired 1999
 - Includes Dongyang, Korea
- 蒂森克虏伯 – 德国 (始建于1876年, 原名斯塔尔)
 - 包括都福 (Dover) – 美国 (1955年) 1999年收购
 - 包括韩国东洋 (Dongyang)
- Kone – Finland (1910)
 - Includes Armor – USA (1935) Acquired 1981
- 通力 - 芬兰 (1910年)
 - 包括Armor – 美国 (1935年) 1981年收购

LONG PRODUCT CYCLES

较长的产品周期

- First Cycle – 20 to 30 Years (Then Modernization)
- 第一个周期 – 20年至30年（然后需要升级改造）
- Later Cycles – 15 to 25 Years (Subsequent Modernizations)
- 后续周期 – 15年至25年（二次升级改造）
- Long Product Cycles Mean
 - Designs Evolve More Slowly
 - Technology Deploys More Slowly
 - Necessity of Longevity / Durability
- 较长的产品周期意味着
 - 设计演变更慢
 - 技术部署更慢
 - 必须耐用/持久

Real Estate Owners / Managers and Major Manufacturers 房地产业主/管理者和主要制造商

- Guard Their Safety / Quality Reputations
 - Quality Maintenance Is a Competitive Advantage
 - The Inverse is Also True. Lack of Maintenance is a Competitive Disadvantage
- 捍卫自己的安全/质量声誉
 - 质量维护是一种竞争优势
 - 反之同样成立：缺乏质量维护是竞争劣势
- Real Estate Owners / Managers Monitor Maintenance Quality
 - Measure Reliability by
 - Calls Per Car Per Year or-
 - MTBC (Mean Time Between Callbacks)
- 房地产业主/管理者监控维修质量
 - 测量可靠性，通过
 - 每台电梯厢每年的呼叫次数或
 - MTBC（回呼之间的平均时间）
- Set Objectives and Measure Results 制定目标并衡量成果
- Measure the Impact of Misuse / Abuse 衡量滥用/误用的影响

Common Causes of Outages 常见故障原因

- Door Operation
 - About 2/3 of Outages are Door-Related
 - Door Systems Interface with the Riders
 - Life Cycles of Door Systems are Shorter
- 门操作
 - 2/3的故障和门有关
 - 门系统是电梯与乘客之间的接口
 - 门系统的寿命周期更短
- Misuse / Abuse
- “Operator Error”
- 误用/滥用
- “操作错误”
- Escalators
 - Misuse / Abuse – Dirt, Foreign Debris, Passenger Abuse
 - Sensitive Safety Devices
- 自动扶梯
 - 误用/滥用 – 灰尘、外来碎片、乘客滥用
 - 敏感的安全装置

Managing Quality & Reliability 管理质量和可靠性

- Superior Operation and Reliability Are:
 - Quantitative
 - Qualitative
 - Measurable
 - Manageable
- 卓越的操作和可靠性是：
 - 量化的
 - 可定性的
 - 可测量的
 - 可管理的
- **When it Works Best – It is a Team Effort**
 - Property Ownership / Management
 - Owner's / Manager's Elevator Consultant
 - Maintenance Contractor
 - On-Site Elevator Personnel
 - Periodic Quality Control Evaluations by Consultant and Contractor
- **要发挥最佳效果需要团队的努力**
 - 物业所有权/管理
 - 业主/管理者的电梯顾问
 - 维修承包商
 - 现场电梯工作人员
 - 由顾问和承包商进行定期质量控制和评估

Managing Quality & Reliability 管理质量和可靠性

- Regular and Systematic Meetings (Monthly or Bi-Monthly)
 - Review of All Service Calls / Outages
 - Root Cause Analysis
 - Overall Quality of Operation and Reliability Metrics
 - MTBC (Mean Time Between Callbacks) = Units X Days ÷ # of Callbacks
 - Analogous to Calls per Car per Year
 - Objective: 120 Days = Three Calls per Car per Year
- 举行定期的系统性会议（每月或双月）
 - 审查所有的服务呼叫/故障
 - 根本原因分析
 - 综合运行和可靠性指标
 - MTBC（回呼之间的平均时间）=单位X天数÷#回呼次数
 - 每台电梯厢每年的类似呼叫次数
 - 目标：120天=每台电梯厢每年3次呼叫
- Pending Repairs
- Test and Inspection Status
- Violations Outstanding
- Recommended Improvements
- Tenant Satisfaction
- Customer Satisfaction
- 待维修
- 试验与检验状态
- 未解决的违规
- 改善建议
- 租户满意度
- 客户满意度

Managing Quality & Reliability

管理质量与可靠性

**“BE PREPARED FOR WHEN
THE BIG PROBLEM
HAPPENS”**

“时刻准备应对大问题的发生”

(HAVE THE TEAM IN PLACE)

(团队随时待命)

QUESTIONS???

问题? ? ?

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谢谢

Thank You!