Session 5:
Case Study: Two New High-Rise Buildings
ABN AMRO Plaza, Chicago, IL

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Presentation Overview
I. The Project
II. The Technology
III. The Commissioning Process
IV. Lessons Learned
V. Questions and Answers
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I. The Project
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Project Details

- 29 Floors, 1.4M GSF
- 180K GSF Mission Critical Area
- 60K GSF Data Center
- 780K GSF Under-floor Air

Office Environment
- Construction Start - July 2001
- First Occupancy - August 2003
- Substantial Completion - November 2003
Start Construction - 7/23

Issue Commissioning RFP - 3/12
Commissioning Agent Selected - 4/1
Major Weather Event - 5/11
Start Mission Critical Commissioning - 6/25

Turnover Commissioned Mission Critical System - 8/25

Building Substantial Completion - 11/25
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Buy-out Strategy

• Selected Turner on Basis of Partial Guaranteed Maximum Price
• Hines & Turner add Site Acceptance/ System Integration Testing Program (SASIT) to Subcontractor Scopes
• Turner Issues Subcontractor RFP’s
• Hines & Turner Interview Subcontractor Scopes and Pricing
• Turner Contracts with Successful Subcontractors Including SASIT Program

*NOTE: Turner was not contractually obligated to SASIT Program
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Contracting the Commissioning Agent

• Recognized Lack of Experienced Mission Critical Commissioning Leadership in Construction Team
• Convinced Owner of the Need for a Commissioning Agent for Mission Critical Equipment and Systems
• Performed Thorough Check of Qualifications of Participants Before Issuing RFP
• Issued RFP for Commissioning Agent Services on a Competitive Lump Sum Basis
• Assigned Commissioning Agent to General Contractor
II. The Technology

- Project ‘Mission Critical’ Technology
- Deployment of the SASIT Program
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• 8 12kV Utility Feeds (6 primary, 2 alternate)
• 5 Different Sub Stations Feed Building
• 6 Tel/Data Pathways into Building
• Six 2-MW Mission Critical Generators (plus one 2-MW Life Safety Generator)
• 45,000 Gallons of Diesel Fuel Storage (48 hours run time-minimum)
• 64,000 kVA of UPS, Batteries Selected to Provide 15 minutes at End of Life
• 90,000 Gallons of Domestic Water Storage
• 45,000 Gal. of Fire Sprinkler Water Storage
• Redundant Chiller Plant (2N+1) with Dual Chilled Water Risers
• Redundant Building Controls System with Auto-Transfer Capabilities
• Multiple FM-200 and Pre-action Systems
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Production and Support Areas
“Single Corded” Critical Loads

Service Products
Critical Equipment

Single-mod UPS

UPS A Outlet

Batteries

“A” Side

ATO Switch

Utility Primary #1

Utility Alternate #1

UPS B Outlet

Batteries

Single-mod UPS

“B” Side

ATO Switch

Utility Primary #2

Utility Alternate #2

Critical Support Sys
& Tel/Data Outlets

MC Gen

Tie Switch
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Single Corded Critical Loads with “Static Transfer Switch”

“UPS” Outlet

Security Command & Trading Floors

Single-mod A UPS
Batteries

Static Transfer Switch

Single-mod B UPS
Batteries

“A” Side

Utility Primary #1
Utility Alternate #1

ATO Switch

MC Gen

Utility Primary #2
Utility Alternate #2

ATO Switch

“B” Side

Tie Switch

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UPS Systems Overview

Mechanical & Electrical
Trading Floors

Controls and Security
Tel/Data Rooms

Four UPS Systems
Spec Prod UPS
Spec Prod UPS
Data Center UPS-A
Data Center UPS-B

Data Center
SPG
SPG
Cafe
Security / Secure Lobby
Lobby & Retail
275 Parking Spaces

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Domestic Water, Fuel, & Fire Sprinklers

- 90,000 gallons Domestic (potable) Water Storage – LL2
- 45,000 gallons Fire Sprinkler Water Storage – LL2
- 45,000 gallons Diesel Fuel Storage – LL2

Typical Office

Mechanical & Electrical

Data Center
- SPG
- Cafe
- Security/Secure Lobby
- Lobby & Retail

Ground

MC Gen

EM Gen

275 Parking Spaces

Domestic Water

Fire Sprinkler

Cooling Towers

6 & 7 Parking Spaces

Security/Secure Lobby

Lobby & Retail
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Electrical Distribution Overview

Utility Primary #1
Utility Primary #2
Utility Primary #3
Utility Primary #4
Utility Primary #5
Utility Primary #6
Utility Alternate #1
Utility Alternate #2

PDU
MECH
UPS
CSS
CT
NT
1/2 TWR

MC Gen

MC Gen
• Reinforced the ‘SASIT’ Program Requirements and Expectations to All Sub-Contractors
• Redirected Sub-Contractors Focus to SASIT Testing and Not Just ‘getting it done’
• Worked Hand-in-Hand with the Commissioning Agent Insuring SASIT Guidelines were Followed
III. The Commissioning Process

• Challenges for the Commissioning Agent
• Flexibility in Support of Design and Construction Oversight
• Plan for Resolving Open Commissioning Issues Post Construction
Challenges for the Commissioning Agent

- Aggressive Learning Curve
  - Design Intent
  - Design Documents
  - Submittals
  - Sequences of Operation
- Quickly Integrate with Design, Construction and Management Team Members
- Prepare SASIT Test Procedures in a Timely Manner
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Flexibility in Support of Design and Construction Oversight

- Perform Routine Walk-thrus and Inspections
- Identify Potential Design Discrepancies
- Provide Recommendations to Resolve Design Discrepancies
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Flexibility in Support of Design and Construction Oversight

- Provide Observations on Obstacles to Commissioning and Integration Time Line
- Provide Suggestions to Help Meet Project Schedule
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Plan for Resolving Open Commissioning Issues in Post Construction

- Catalogue Discrepancies Noted During Commissioning
- Provide Recommendations on Discrepancy Resolution
- Provide Assistance in Ongoing Commissioning
IV. Lessons Learned
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Lessons Learned

• Hire the Commissioning Agent as Early as Possible
• Contract the Commissioning Agent in the Most Advantageous Manner
• Have the Commissioning Agent Perform a Peer Review Early During the Design Process
• Confirm the Contractor’s Schedule has Ample Time for Commissioning
• Develop a Concise Commissioning Plan (SASIT or whatever) from the Start
V. Questions and Answers