



**U.S. Department of State  
Overseas Buildings Operations**

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**Building Commissioning**

**Federal Facilities Council Forum**

**National Academy of Sciences - Washington, DC**

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**October 9, 2003**



# *The Challenge*

*On April 26, 2001, in a statement delivered to the House Subcommittee on Commerce, Justice, State, and Related Agencies Appropriations, Secretary Colin Powell indicated that the highest priority facing the Overseas Buildings Office is:*

*“...to get construction projects completed on time, under cost and in the most efficient way possible.”*

*And to ensure that these construction projects result in:*

*“...well-built, secure and modern embassies...”*

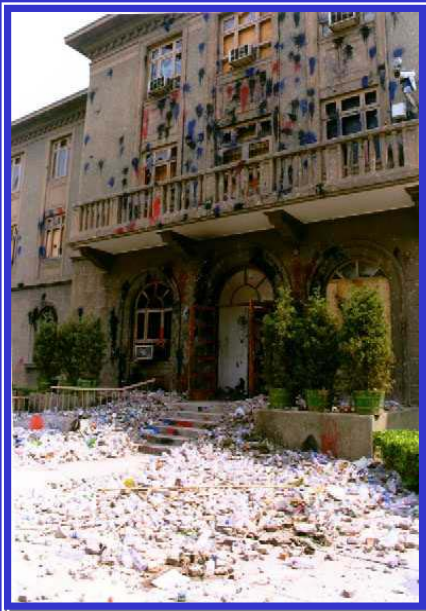




# Security is Paramount

**“The need to adequately protect employees and their families from threatened terrorist attacks overseas may very well be the single most important management issue currently facing the State Department.”**

***U. S. GAO, January 2001***



**Beijing 1999**



**Nairobi 1998**



**Dar es Salaam 1998**



**Skopje 1999**





# *Why We Must Rebuild Our Embassies*

- **THE 1998 BOMBINGS IN EAST AFRICA:**

- Killed more than 220 people  
(including 12 Americans)
- Injured more than 4,000



**Nairobi, Kenya**  
**Dar es Salaam, Tanzania**

- THERE ARE OVER **60,000** USG EMPLOYEES FROM 35 AGENCIES AT THE 260 POSTS OVERSEAS

- MOST OF OUR EXISTING EMBASSIES DO NOT MEET CURRENT SECURITY STANDARDS





# *Capital Security Construction Program*

## **The Long Range Plan for Construction:**

- **160** new embassy and consular compounds
- total capital cost of **\$16 billion**
- funded over 12 years
- annual cost of **\$1.5 billion**





# *New Embassy Compound (NEC)*

## *Awards in FY 02*

- **Abidjan, Cote d'Ivoire**
- **Abuja, Nigeria**
- **Cape Town, South Africa**
- **Conakry, Guinea**
- **Dushanbe, Tajikistan**
- **Frankfurt, Germany NAB**
- **Jerusalem consular annex**
- **Kabul, Afghanistan**
- **Phnom Penh, Cambodia**
- **Sao Paulo, Brazil**
- **Tashkent, Uzbekistan**
- **Tbilisi, Georgia**
- **Yaounde, Cameroon**





# *NEC Awards for FY 03*

- **Astana, Kazakhstan**
- **Bamako, Mali**
- **Bridgetown, Barbados**
- **Frankfurt, Germany**
- **Freetown, Sierra Leone**
- **Kingston, Jamaica**
- **Tirana, Albania - Annex**





# *NEC Awards Planned for FY 04*

- **Accra, Ghana**
- **Algiers, Algeria**
- **Lome, Togo**
- **Belgrade, Yugoslavia**
- **Panama City, Panama**
- **Rangoon, Burma**
- **Surabaya, Indonesia**
- **Abuja, Nigeria - USAID**
- **Accra, Ghana - USAID**
- **Kingston, Jamaica - USAID**







# Doing Business Challenges





# *Logistics Challenges*



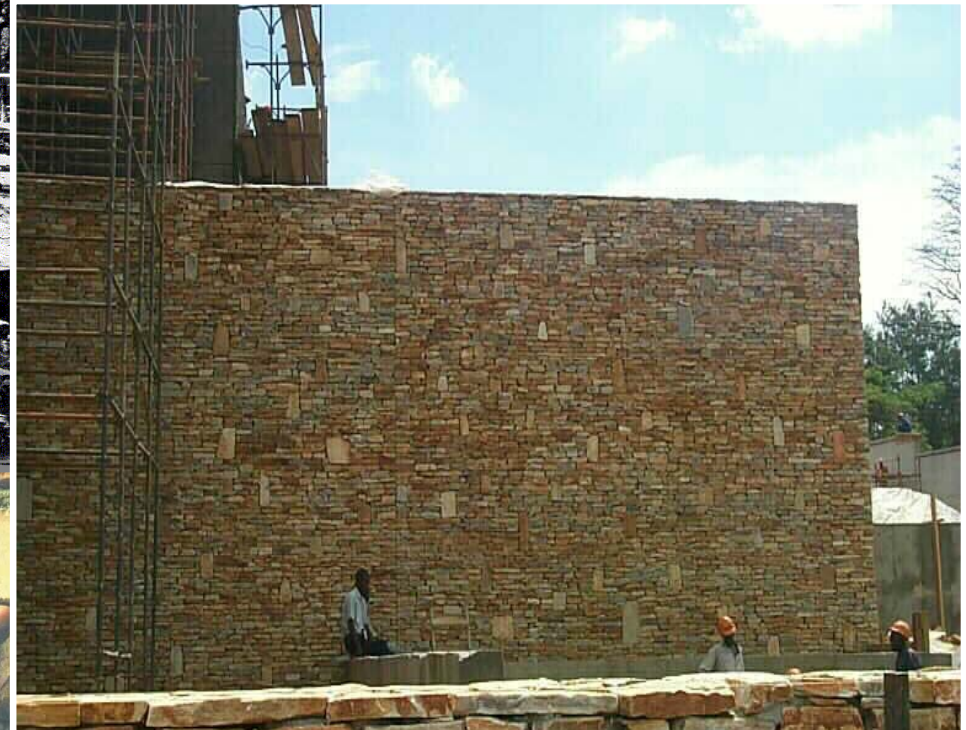
*Salvaging material at Entebbe (in Lake Victorian near Kampala)*



# *Labor and Materials*



**Their way**



**Our way**



# *Construction Challenges*



*Caracas NOB*

*Ottawa-Typical wall construction*



# Recently Completed Projects





# Zagreb, Croatia NEC



100% Complete



# *Istanbul, Turkey NEC*



100% Complete





# Projects Under Construction







# *Abu Dhabi, United Arab Emirates NEC*





# *Kabul, Afghanistan NEC*

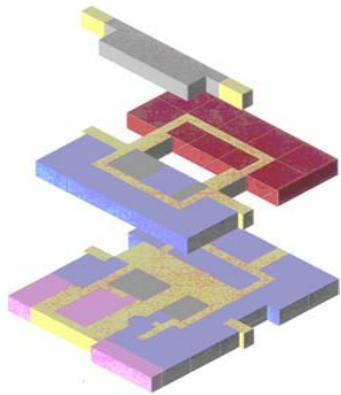


Phase 1 Complete  
Phase 2 In Process





# Standard Embassy Design (SED) Overview



Level Three

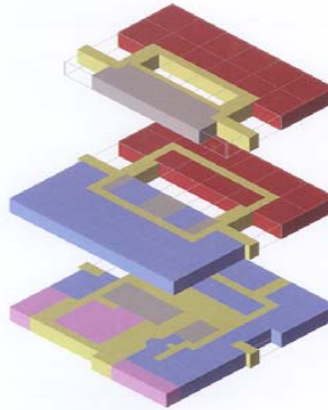
Level Two

Level One



## Small

Construction Cost: ~ < \$47 M\*  
Size: ~ 4,300 gsm  
Planning Duration: ~ 6 mo.  
D/B Acquisition Duration: ~ 6 mo.  
Design/Construction Duration: ~ 15 mo.  
Commissioning Duration: ~ 2 mo.  
Total Project Duration: ~ 29 mo.



Level Three

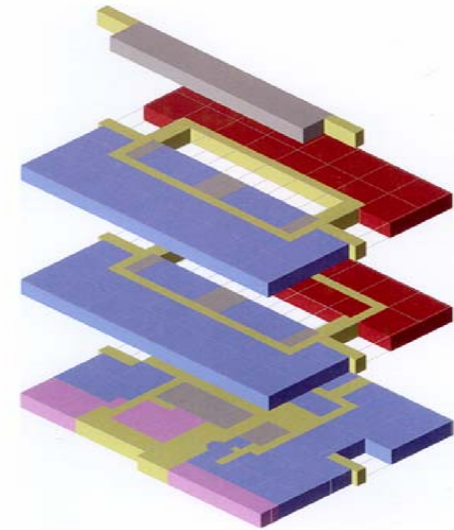
Level Two

Level One



## Medium

Construction Cost: ~ > \$68 M\*  
Size: ~ 4,300-7,400 gsm  
Planning Duration: ~ 6 mo.  
D/B Acquisition Duration: ~ 6 mo.  
Design/Construction Duration: ~ 24 mo.  
Commissioning Duration: ~ 2 mo.  
Total Project Duration: ~ 38 mo.



Level

Level

Level



## Large

Construction Cost: ~ < \$88 M\*  
Size: ~ > 7,400 gsm  
Planning Duration: ~ 6 mo.  
D/B Acquisition Duration: ~ 6 mo.  
Design/Construction Duration: ~ 28 mo.  
Commissioning Duration: ~ 2 mo.  
Total Project Duration: ~ 42 months

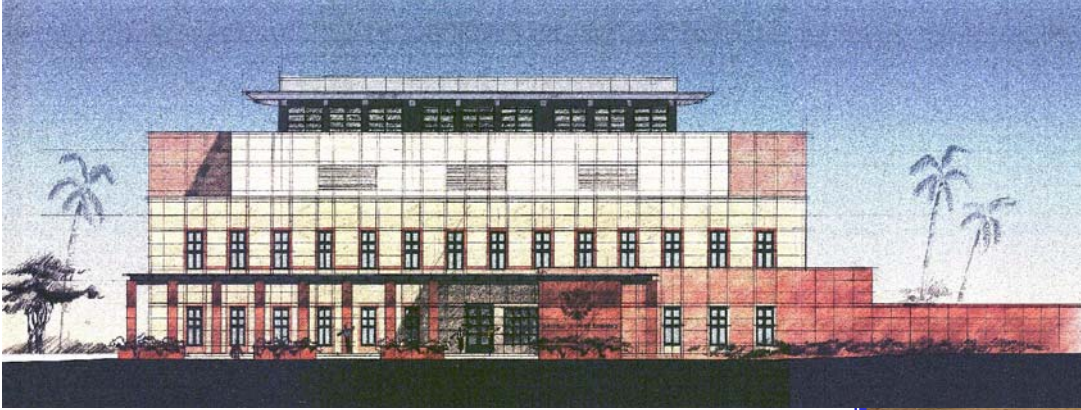


# *Dushanbe, Tajikistan NEC*





# Conakry, Guinea NEC





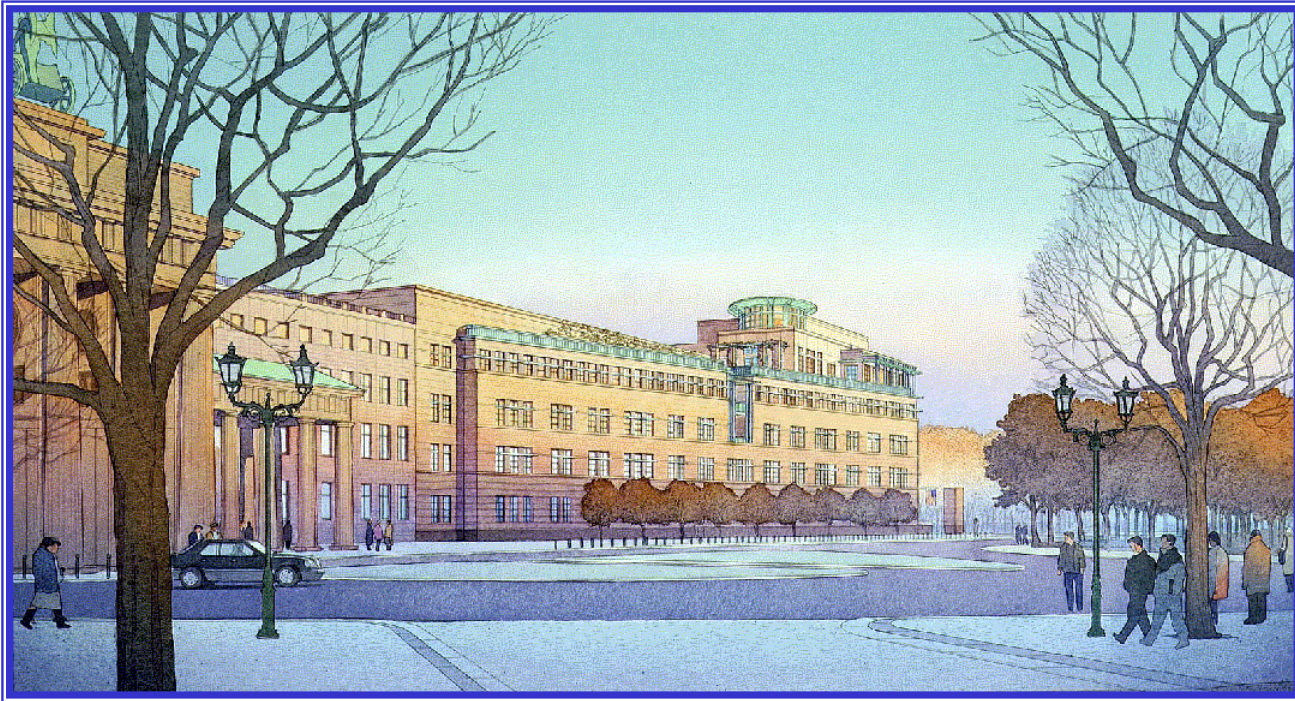
# Yerevan, Armenia NEC





# Major Projects in Planning & Design





## *Berlin*

- Sited next to Brandenburg Gate
- Design to be completed in Early 2004





# *New Embassy Compound Beijing, China*



October 9, 2003





# OBO Building Commissioning Practices





# *Why Commission Your Building?*

## **A recent study of 60 New Commercial Buildings found:**

- **50%** suffered from control problems
- **40%** had problems with HVAC equipment
- **33%** had sensors that were not operating properly
- **15%** of buildings did not have the equipment specified
- **25%** of the buildings had energy management control systems, economizers or variable-speed drives that did not function properly

– source: **Oregon Office of Energy**





# *Typical Project Commissioning Team*

- The Commissioning Authority - designated by the Contractor to objectively develop and execute the Commissioning Plan coordinating with all elements of the project team.
- The DOS Accreditation team lead by Diplomatic Security has the responsibility of providing the final physical and technical security inspection and Accreditation for all DOS construction projects.





# *Typical Commissioning Agenda*

- The Contractor's Commissioning Authority and his quality assurance staff manage the Commissioning Plan with oversight/coordination by the OBO Project Director.
- OBO Technical and Professional staff assist the onsite OBO Project Director in oversight of the execution of the Commissioning Plan (Fire Protection and Life Safety systems; Chem-Bio Filters; Elevators; Communication systems)



# *Summary of Commissioning Tasks*

- Ensure that the Design considers start-up and commissioning concepts
- Functional Field Testing of Systems and Equipment
- Training of USG staff in O&M of bldg.systems
- Transfer of O&M requirements and supporting documents to Post Facilities Management





# *Commissioning is Important for Complex Systems in Remote Locations*

- Environmental Security Protection for Occupants **(Chem/Bio Filters)**
  - Gas absorption filters for the Chemical threat
  - Particle filters for the Biological threat
- **Zones of Pressurization to Protect against the threat**
  - Highest pressure for the executive offices
  - Public area at a higher pressure than the outside





## Typical Chem/Bio filter system







# *Commissioning Plan*

OBO is pursuing development of a Standardized Commissioning Plan & Forms through a grant with DOE-FEMP. The plan will Provide:

- A comprehensive Model Commissioning Plan for use on all Department of State contracts
- Standardized Verification Checklists and Functional Performance Test forms for use in commissioning DOS projects



# *Commissioning Forms*

**Develop standardized commissioning test forms which will :**

- **Develop verification checklists**
- **Develop functional performance test procedures**
- **Document data on functional test record sheets for each system commissioned**
- **Detail how system deficiencies should be noted and scheduled for correction**
- **Detail retesting procedures to address deficient systems and finalize all functional performance test forms**





# *Best Commissioning Practices*

- **Engage a Commissioning Authority**
- **Document design intent and basis of design for buildings and systems.**
- **Include commissioning requirements in the construction contract documents**
- **Develop a Commissioning Plan**
- **Verify installation, functional performance, training and documentation**
- **Complete a Commissioning Report**





# *DBOM*

*(Design-Build-Operate-Maintain)*

## Some of the advantages of DBOM:

- Workers can possibly transition from construction to maintenance
- Comprehensive On-the-job Training can be provided by the contractor to post O&M staff
- The maintenance price will be firmly locked in for first two years with additional option years
- Contractor must consider first cost versus operating efficiency - improved building performance
- Affords ample timeframe for post to budget for, hire, and train qualified O&M staff





# *QUESTIONS*

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