



What is New in Value Engineering?

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By Kathy Bethany,
OBO Cost Management Division Director
& SAVE International Exec VP*



Topics for Discussion

- Summary of OBO VE Program
- What's New
- Results



OBO VE Program Requirements

- All Projects:
 - over \$1,000,000
 - with problems
 - over budget
 - or with potential for improvement
- Must have either a VE study or Waiver in place before they reach the 35% design stage



VE Definitions

- Savings are calculated are based on the Cost Estimate reflecting the Documents at the time of the VE Study
 - Proposed savings as estimated by the VE team
 - Accepted proposal per the Implementation Memo prior to construction
 - Implemented proposal per verification by VE Site Assessment near completion of construction
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How does VE benefit OBO?



By giving us the biggest bang for our buck



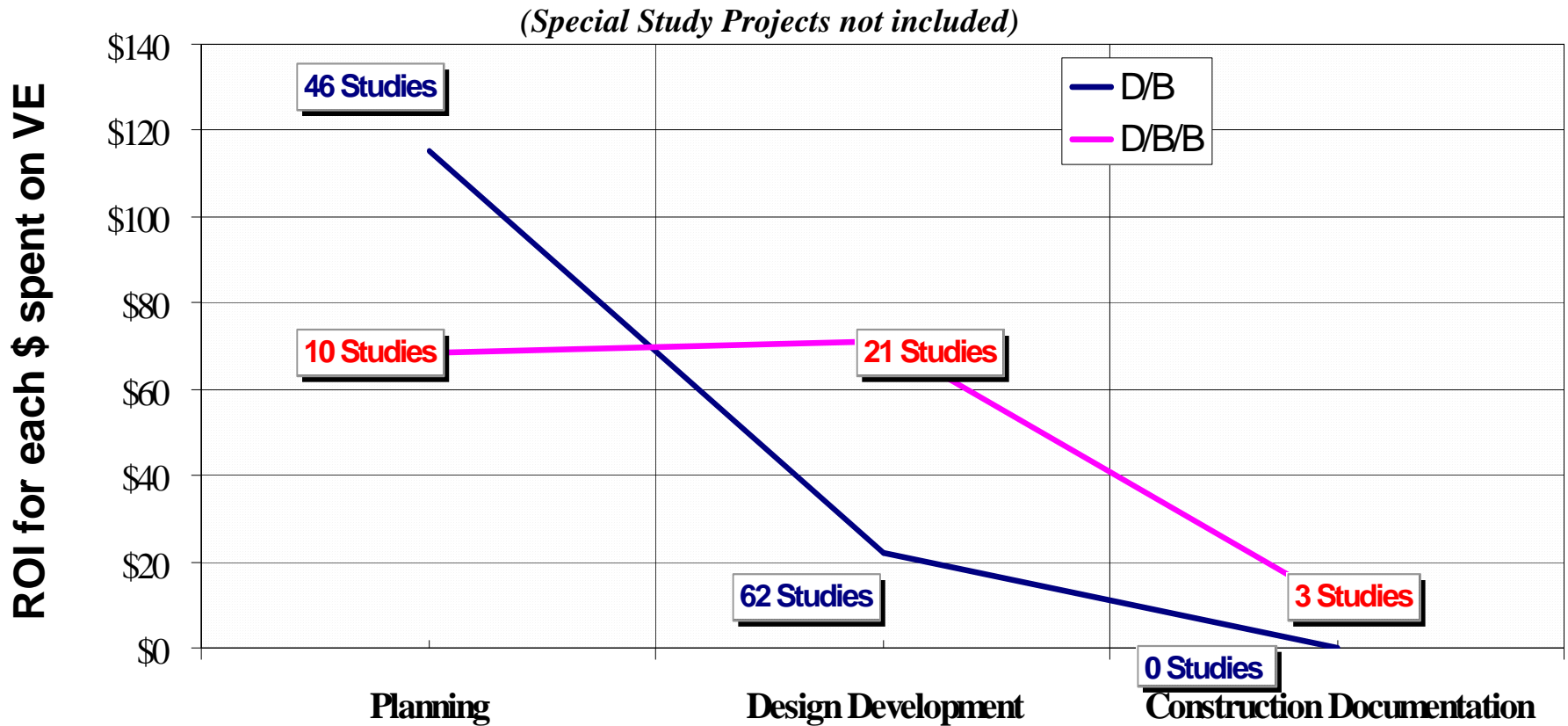
What's New

- VE Staff
 - Reza Darvishian
 - Angela Collins
 - Laurie Dennis (departing)
- VE in Cost Management (in Planning)
- VE Implementation Assessment Trips



VE Return on Investment Summary

Includes projects from 2000 through Sept 2007





Value Engineering Program Summary

Value Engineering is a function oriented, systematic, applied creativity, team process which concentrates on lowering life cycle costs while improving quality and performance. The OBO VE program requires at least one independent VE study, or a waiver, on all projects with an estimated cost of construction greater than \$1M.

Results From OBO VE Program

	From 1987 -- 2005	From 2000 -- 2007
VE Program Cost:	\$9.3M (156 Studies)	\$9.5M (160 Studies)
Total Saved:	\$381.3M (includes \$49.3M O&M)	\$518.5M (includes \$98M O&M)
Return on Investment	\$40 to \$1	\$57 to \$1
# of VE Ideas Accepted for Implementation	1570	2030



VE Program Performance Indicators

FY 2007 Results:

11 VE Studies had 91 accepted VE recommendations to date for a total savings of \$16M which includes \$0.4M in savings in O&M costs

- % Proposed Savings by VE Team*
 - Goal 10% **(Actual 15%)**
- % Accepted VE Recommendations*
 - Goal 4% **(Actual 5.8%)**
- Return on Investment
 - Goal \$20 to \$1 **(Actual \$44 to \$1)**

* compared to estimated cost of construction



VE Savings - Unifomat

L1 Title	L2 Title	Proposed Savings	Sum of # accepted	Accepted Savings
Substructure	Foundations	27,071,854	33	2,477,575
	Basement construction	5,946,943	5	264,780
Substructure Total		34,219,198	40	3,476,355
Shell	Exterior closure	147,690,081	244	65,498,110
	Superstructure	80,800,092	96	46,230,300
	Roofing	12,767,115	38	4,603,403
	Shell	3,096,675	0	0
Shell Total		245,070,778	379	116,375,969
Interiors	Interior finishes	23,788,012	68	11,551,366
	Interior construction	16,011,897	95	10,520,728
	Staircases	3,804,151	32	1,540,008
Interiors Total		51,884,798	204	24,303,158
Services	Electrical	113,125,953	277	70,358,945
	HVAC	95,760,828	254	29,036,840
	Plumbing	9,691,272	70	3,058,975
	Fire Protection	9,135,776	34	1,626,717
	Conveying systems	4,863,856	22	1,555,828
	Services	1,556,171	0	0
Services Total		234,133,856	657	105,637,305
Equipment & Furnishings	Furnishings	1,775,572	6	316,762
	Equipment	927,880	7	230,573
Equipment & Furnishings Total		3,138,653	13	547,335
Special Construction & Demolition	Special Construction	8,383,469	12	1,166,008
	Special Construction & Demolition	949,255	0	0
	Selective building demolition	304,113	4	502,882
Special Construction & Demolition Total		9,636,837	16	1,668,890
Building Sitework	Site Improvements	92,581,257	280	39,386,535
	Site Electrical Utilities	52,209,384	53	15,527,472
	Site Civil/Mechanical	12,151,203	58	2,704,061
	Site Preparation	11,025,465	19	2,864,777
	Other Site Construction	8,937,202	21	3,929,822
Building Sitework Total		180,202,872	433	66,234,667



Examples of VE Proposals Exterior Building Enclosure

- 244 VE Proposals Accepted
 - \$65,498,000 Accepted Savings
 - Examples:
 - Berlin NOB proposal using native stone, accepted savings \$2,000,000
 - Djibouti NEC proposal using paint in lieu of stucco for the exterior, accepted savings \$530,000
 - Jeddah NCC proposal providing stone cladding for NOB only, accepted savings \$782,000
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Examples of VE Proposals Mechanical - HVAC

- 254 VE Proposals Accepted
 - \$29,037,000 Accepted Savings
 - Examples:
 - Bucharest NEC proposal using heat recovery chiller, accepted savings (\$39,100) with life cycle savings \$270,000
 - Ciudad Juarez NEC proposal reducing VAV hot water coils in the interior zones, accepted savings \$160,000 with life cycle savings \$19,000
 - Mumbai NEC proposal using air cooled chillers in lieu of water cooled, accepted savings \$408,000 with life cycle savings \$1,263,000
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Examples of VE Proposals Electrical

- 277 VE Proposals Accepted
 - \$70,359,000 Accepted Savings
 - Examples:
 - Antanarivo NEC proposal using co-generation, accepted savings \$1,004,000 with life cycle savings \$21,770,000
 - Manila Security Upgrades proposal using duckbanks to reduce homeruns, accepted savings \$220,000
 - Tunis NOB proposal deleting voltage regulator and make provisions for the future if needed, accepted savings \$235,000
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Examples of VE Proposals Site Improvements

- 280 VE Proposals Accepted
 - \$39,386,000 Accepted Savings
 - Examples:
 - Bogota NOB proposal using yard hydrants or water trucks in lieu of temporary irrigation, accepted savings \$93,000
 - Quito NEC proposals simplifying the hardscape plan and details, accepted savings \$306,000
 - Sarajevo NEC proposal replacing the interior roadway paving with asphalt instead of concrete, accepted savings \$349,000
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Verification

- Conduct Site Assessment Trips
- Validate Implementation
- Gather Lessons Learned
- Recommendations for Future Projects

15 Sites visited for 22 VE studies

712 Proposed Alternatives

184 Accepted

290 Implemented with Verification



VE Site Assessment Managua NOX





VE Site Assessment Managua NOX

- VE Team Proposed Total Savings \$479,200
- Accepted Total Savings \$787,300
- Implemented Total Savings \$787,300



VE Site Assessment Managua NOX

- VE Proposal M-8 Combine and reduce the number of AHUs
 - Potential Initial Savings \$174,700 plus O&M \$211,500
 - OBO Accepted the VE Proposal
 - VE Site Assessment confirmed Implementation
 - This VE Proposal incorporated into the SED
 - VE Proposal E-9 Eliminate power factor correction equipment
 - Potential Initial Savings \$5,200
 - OBO Accepted the VE Proposal
 - VE Site Assessment confirmed Implementation
 - This VE Proposal incorporated into the SED
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VE Study Goal



*A functional facility
worth its cost*
