

Cost Estimating Community of Practice

4th Annual Symposium

August 4-6, 2020 Sandia National Laboratories



WELCOME FROM SNL ASSOCIATE LABS DIRECTOR, STEVE P. GIRRENS



Welcome to the Fourth Annual Cost Estimating Community of Practice (CECOP) Symposium, on behalf of the Cost Estimating Analysis Group and NNSA.

This year's symposium is hosted by Sandia National Laboratories in Albuquerque, New Mexico. Due to COVID-19, however, Sandia now welcomes you to the first virtual CECOP symposium.

CECOP was formed by NNSA's eight sites and Headquarters for the purpose of exchanging cost estimating best practices through collaborative relationships within government, industry, and the Nuclear Security Enterprise / e welcome all the cost-estimating professionals from NNSA, DOE, DOD, contractors, and other experts in the field seeking continuous improvement by participating in this

dynamic collaboration over the next three days.

A special welcome to our accomplished keynote speakers, Dr. William Bookless and Ms. Jennifer Rose. Dr. Bookless serves as the Principal Deputy Administrator of the U.S. Department of Energy's National Nuclear Security Administration. Ms. Rose serves as Director of the Cost and Acquisition Assessment Group within the National Reconnaissance Office Business Plans and Operations Directorate. It's an honor to have them with us at our Symposium, and I thank them both for their participation.

The value of cost estimating is undeniable to the daily investment we make as stewards of nuclear deterrence and as public servants in the national interest, and I hope you also find value at this year's symposium.

Sincerely,

Steven P. Girrens Associate Labs Director, Nuclear Deterrence Chief Engineer for Nuclear Weapons Sandia National Laboratories

2020 CECOP SYMPOSIUM

COST ESTIMATING ANALYSIS GROUP (CEAG)



The Cost Estimating Analysis Group (CEAG) is a Nuclear Security Enterprise (NSE) wide working group with membership from the nuclear weapon design and production agencies and federal program directors and managers. CEAG is a principal source for cultivating expertise, experience and excellence for the National Nuclear Security Administration (NNSA) cost estimating capabilities.

CEAG leads a focused effort to continue to improve NNSA's and each site's ability to forecast the scope, resources, and funding required in executing programs, while also developing associated skill sets and fostering communication, collaboration, and information sharing.

CEAG leverages existing individual capabilities, evaluates models, and conducts requested analysis to support the needs of NNSA. CEAG is based on the following principles:

- Emphasis on enterprise-wide perspective in addition to and aligned with site perspectives
- Participation from all NNSA sites
- Encourage original and innovative analytic approaches with potential to develop insight and confidence in results
- Mutual respect and transparency with open and honest dialogue among all members and participants
- Validation and verification of models is integrated into the model development and analysis activities
- Sites negotiate their deliverables, resources, and intellectual property issues

The CEAG Council is comprised of representatives from across the NSE, integrating the knowledge and expertise of professionals at the sites and NNSA headquarters and is chaired by NA-MB. Management and Budget. CEAG was chartered to lead independent cost estimate reviews and other cost analysis efforts as requested by NNSA leadership and approved by the CEAG Leadership Team. CEAG is also responsible for leading the Cost Estimating Community of Practice (CECOP) and establishing cost estimating procedures, methodologies, and best-practices specific to Defense Programs activities. This both informs higher-fidelity cost estimating efforts and fosters more effective communication and collaboration.

The CEAG Council nominates the members of the CECOP Committee who are responsible for the development of the CECOP Symposium as well as organizing information exchanges and educational opportunities. Chaired by Dr. William Conwell of NA-MB, the 2020 CEAG Council Members and Site Representatives include:

Site	Council Members	Site Representatives
CNS – Y-12 & PX	Eric White	
KCNSC	Michelle Oaks	Meagan Ladwig & Chad Andrews
LANL	Tri Duc Tran	Eric Witt & Brian Temple
LLNL	Cliff Shang	Carol Myers
NNSA	Fana Gebeyehu-Houston	
NNSS	Casey Hulet	Kimberleigh Baltimore
SNL	Kim Welch	Phil Chamberlin
SRS	Jim Wong	Carter Hopkins
Council Support Team		
Kathleen Lane (Detail)	Dipali Amin (NNSA)	David Zimmerman (Detail)

COST ESTIMATING COMMUNITY OF PRACTICE



The Cost Estimating Community of Practice (CECOP) is an informal gathering of cost estimating practitioners. Like an academic consortium, CECOP is focused on training, education, and the exchange of cost estimating methodologies and best practices. This focus is correlated to the unique mission and conditions relating to the Nation's Nuclear Security Enterprise (NSE). Cost estimating professionals from the NNSA, Department of Energy, Department of Defense security enterprise, contractors, and other experts in the field participate in the annual CECOP Symposium.

It is important to note that CECOP as a body is not directly involved in Defense Programs' projects, CECOP is a standalone group focused on communication, community building, and knowledge exchange through yearly symposia that concentrate on cost estimating-focused tracks. The planning, programming, budgeting, and evaluation of major modernization programs for our nuclear weapons stockpile involves complex, dynamic, and interdependent processes across the NSE. This means estimating costs for these activities requires an integrated, holistic approach.

The CECOP leadership team sets the priorities for CECOP and develops its values and guiding principles. Primary participation has been from the NNSA and NSE. As the com munity is expanding and the pool of participant expertise increases, the Cost Estimating Analysis Group (CEAG) draws specific expertise from the CECOP for CEAG projects. The continued success of CECOP is one of CEAG's highest priorities. As the parent organization, CEAG Council Members are actively involved in CECOP and nominate members from their site to serve on the CECOP Symposium Planning Committee based upon their cost estimating experience. The Committee is responsible for planning the annual CECOP Symposium and organizing various information exchange meetings and educational opportunities throughout the course of the year. The Committee who planned this year's symposium include:

2020 CECOP Symposium Planning Committee Members			
Kathleen E. Lane	NNSA	Susan Lawson	SNL
Dipali R. Amn	NNSA	Charles A. Luce	SNL
David E. Zimmerman	NNSA	Carla Moncayo Jordan	SNL
Megan K. Ladwig	KCNSC	Shannon G. Yeoman	SNL
Jennifer K. Casias	LANL	Leone Young	SNL
Nathan E. Clough	SNL	Carter Hopkins	SRS
Phil Chamberlin	SNL	Deb Vogel	Contractor
Anita M. Dotson	SNL		

Now marking its fourth annual symposium hosted by Sandia National Laboratories, this CECOP event has grown to a community of over 300 cost-estimating practitioners from NNSA's labs, plants and sites, as well as the National Aeronautics and Space Administration and private industry participating in this year's first virtual symposia.

2020 CECOP SYMPOSIUM

KEYNOTE SPEAKER DAY ONE



DR. WILLIAM BOOKLESS

Dr. William Bookless was confirmed by the U.S. Senate on May 23, 2019, as the Principal Deputy Administrator of the National Nuclear Security Administration. He brings over 35 years of experience in the Nuclear Security Enterprise to this leadership role.

As NNSA's Principal Deputy Administrator, Dr. Bookless supports NNSA Administrator Lisa E. Gordon-Hagerty in the management and operation of the NNSA, as well as policy matters across the DOE and NNSA enterprise in support of the President's nuclear security agenda. Dr. Bookless supports the full range of NNSA missions to maintain and enhance the safety, security, and effectiveness of

the U.S. nuclear weapons stockpile; reduce the global danger from weapons of mass destruction; provide the U.S. Navy with safe and effective nuclear propulsion; and respond to nuclear and radiological emergencies in the United States and abroad.

Dr. Bookless served 32 years as a senior physicist at Lawrence Livermore National Laboratory (LLNL) in Livermore, California, where he worked on a wide range of nuclear security topics. Among his roles were project leader for investigating the effects of pulsed, high-current electron beams and investigating the effects of X-ray lasers; deputy leader of one of LLNL's nuclear weapons design divisions; associate program leader in the nuclear test program; and program leader for Nuclear Weapons Surety. He was the Deputy Associate Director of Defense and Nuclear Technologies and also served as Associate Director of Safety and **Environmental Protection.**

After his tenure at LLNL, Dr. Bookless served as Assistant Laboratory Director for Policy and Planning at Brookhaven National Laboratory in Brookhaven, New York for three years. From 2009 to 2012, he served as a Senior Advisor to the NNSA Administrator for policy.

Dr. Bookless holds a Doctorate degree in physics from the University of Wyoming and a Bachelor's degree in physics from Southern Illinois University.

KEYNOTE SPEAKER DAY TWO

MS. JENNIFER ROSE Ms. Jennifer Rose serves as the Director of the Cost and Acquisition Assessment Group (CAAG) within the National Reconnaissance Office (NRO) Business Plans and Operations Directorate since November 2017. Ms. Rose joined the Defense Intelligence Senior Leader ranks with this appointment. As Director of CAAG, she manages cost analysis and integrated performance management functions for the agency.

Prior to joining the NRO, Ms. Rose led the National Geospatial-Intelligence Agency (NGA) Cost Assessment Division within the Corporate Assessment and Program Evaluation (CAPE) Office. Her group conducted unbiased, independent cost and

resource analysis in support of NGA planning and programming activities, acquisitions, and CAPE studies. Ms. Rose previously worked for defense contractor TASC, holding numerous positions reflecting growth in technical knowledge and responsibility over a 19-year period. Her technical expertise ranges across cost analysis; data analysis; budget planning, programming, budgeting, and execution; portfolio management; earned value management and analysis; program justification and advocacy; systems engineering; and acquisition support. She applied these skills as a direct support analyst for NGA, NRO, Defense Finance and Accounting Service, Army, Navy and Air Force. Ms. Rose concurrently held corporate leadership positions while providing direct support.

In her last formal leadership role at TASC, Ms. Rose served as the Cost and Risk Analysis Division Director within TASC's Financial Business Analytics Center of Excellence. She was responsible for over 50 analysts and approximately \$12M of revenue based on cost analysis services across various customers in the Intelligence Community, Department of Defense and Civilian Agencies.

Ms. Rose began her career as a cost analysis intern with the Naval Center for Cost Analysis in 1994. She graduated with a Bachelor of Arts degree with a double major in Mathematics and English from Washington College, Chestertown, MD and earned a Master of Science degree in Operations Research from the College of William and Mary, Williamsburg, VA. Ms. Rose is a Certified Cost Estimator/Analyst with the International Cost Estimating and Analysis Association and a Level III certified Defense Acquisition University Business Cost Estimator.

2020 CECOP SYMPOSIUM

SCHEDULE DAY ONE

August 4	Day 1 Presentations
11:00 - 11:05	Welcome and Opening Remarks
11:05 - 11:50	Keynote Speaker Dr. William Bookless Principal Deputy Administrator of the National Nuclear Security Administration
11:50 - 12:20	CSPER-C Model Dr. Charles Loelius Charlie will provide an overview of Cost, Schedule, and Phasing Estimation Relationships for Construction (CSPER-C) that NA-MB-92 has developed to support long term capital planning. His discussion will describe the basis of the model in actual costs, schedules, and profiles from NNSA projects, followed by an outline of the estimating relationships and the key cost and schedule drivers. Recent and future updates to the model will then be presented for discussion.
12:20 - 12:35	Break
12:35 - 1:05 1:05 - 1:45	 Working Toward Mitigating Cognitive Biases in Analogous-Based Cost Estimating Models Dr. Jonell N. Samberson The ability to measure and assess the influence that cognitive biases have regarding SME inputs for complexity estimates is challenging. Jonell will first discuss a modified Estimate Input Checklist and Maturity Matrix for nuclear warheads and will then apply this checklist to the quantitative assessment of the SME complexity estimates to see if they fall within the expected range given a program's level of maturity. LANL Weapons Program Estimating Approach Danny R. Salazar, MBA, PMP and Lee Hornsby, MBA This presentation will review LANL's approach to standardizing a Work Breakdown Structure for all new work to ensure consistency in estimating approach. Including the use of historical data and utilization of Technical Subject Matter Experts to support bottoms-up estimating, this presentation is intended to share the lessons learned and applied from previous weapons program to help define an improved approach to estimating.
1:45 - 2:00	Break
2:00 - 2:40	Quick, Consistent, and Relevant Capital Investment Programming LevelBudget EstimatesChristopher Nesbit and Nathan CloughLeveraging data available at DOE, NNSA, industry and subject matter expertise, Sandia has developed a consistent methodology for establishing early site developed point estimates. This bottoms-up estimating methodology, presented at previous CECOP conferences, has been updated to include Monte Carlo Simulation to inform the uncertainty aspects of developing early notional estimates.
2:40 - 2:45	Closing Remarks / Adjourn Day of Symposium

SCHEDULE DAY TWO

August 5	
11:00 - 11:05	Welcome and Opening Remarks
11:05 - 11:50	Keynote Speaker Ms. Jennifer Ro Director of the Cost and Acquisiti Office
11:50 - 12:30	Creating and Maintaining a Mat Michael C. Emmons
	In 2018, Lawrence Livermore Nat Cost Report since the W80-3 Life describes the process and lesson Material Requirements Schedule.
12:30 - 12:45	
12:45 - 1:25	A Technical Solution to Preservin Program Data Terry Josserand
	Terry asks, "What process does ye relationship of traceable nuclear data?" His presentation will addr of the technical solution, and des historical nuclear weapon moder
1:25 - 2:05	Realistic Cost Estimates (RCEs): Evaluation Ben Truskin
	The NRO is piloting a new approa presentation delves into how cos documents the mathematical and large pilot source selections.
2:05 - 2:20	
2:20 - 2:50	Cost Estimating Informed by De Andrea M. Dorado
	This presentation will focus on ar Based Systems Engineering, and modernization program cost esti Enterprise.
2:50 - 2:55	Closing Remarks / Adjourn Day 2

2020 CECOP SYMPOSIUM

Day 2 Presentations

ose

ion Assessment Group at the National Reconnaissance

erial Requirements Schedule

ational Laboratory completed its first Weapon Design & e Extension Program nearly twenty years ago. Mike's talk ns learned in creating and maintaining LLNL's inaugural

Break

ng Historical Nuclear Weapon Modernization

your organization utilize to capture and maintain the r weapon modernization program lifecycle scope and cost ress some of the challenges, present the architecture scribe the path forward on this journey of preserving rnization data.

The NRO's Innovative Pilot Program for Contract Cost

ach to awarding spacecraft acquisition contracts. This st estimators tackled assessment of cost realism and id social challenges surmounted in applying this to several

Break

esign

n alternative systems engineering architecture, Model the benefits it may provide to nuclear deterrence imating and analysis efforts across the Nuclear Security

2 of Symposium

SCHEDULE DAY THREE

August 6	Day 3 Presentations
11:00 - 11:05	Welcome and Opening Remarks
11:05 - 11:45	Capital Acquisition Planning and Estimating Todd James Proffitt
	Todd's presentation will provide an overview of how LANL estimating supports the capital acquisition process. Meeting the needs of the project teams is not the only requirement of an estimate, but this presentation will demonstrate how this procedure meets the requirements of the DOE and the GAO.
11:45 - 12:25	The Lewis and Clark Expedition's Integrated Cost, Schedule, and Risk Analysis Robert Fatzinger
	Robert asks, "Would the application of historical data and integrated cost, schedule, and risk analysis have improved the reliability of Thomas Jefferson's initial estimate for the Lewis and Clark expedition in 1803?" This presentation will examine the application of Recommended Practice 57R-09 to more common, phase-gate projects of moderate size, scope and complexity through lightweight and flexible Microsoft Excel modeling using the lens of the Lewis and Clark Expedition.
12:25- 12:40	Break
12:40 - 1:20	Comprehensive Records and Estimating System Andrew Zobay
	Charlie and Kayee will review the study results focusing on the NNSA acquisition policy implementation efficiencies, inefficiencies, and recommendations that could support the delivery of infrastructure modernization faster and more affordably to support the long-term success of the DOE and NNSA's capital acquisitions
1:20 - 2:00	DOE O 413.3B NPR Implementation Plan Efficiency Study Dr. Charles Loelius and Kayee Leung
	The NRO is piloting a new approach to awarding spacecraft acquisition contracts. This presentation delves into how cost estimators tackled assessment of cost realism and documents the mathematical and social challenges surmounted in applying this to several large pilot source selections.
2:00 - 2:15	Break
2:15 - 2:45	A Model for Cost Optimization and Cost as An Independent Variable – Paradigms for Parametric Estimating Fana Gebeyehu-Houston
	This presentation will explore the value of parametric estimating in identifying key design parameters that drive costs. The Material Staging Facility is a potential Hazard Category 2 facility being proposed for construction at the Pantex Plant in Amarillo, Texas. The CD-0 estimate provides a case study in identifying key design parameters that will drive cost performance.
2:45 - 2:50	Closing Remarks / Adjourn Day 3 of Symposium

PRESENTERS



NATHAN CLOUGH - SNL, PROJECT MANAGER

Nathan is the Sandia Design Agency (DA) Finance Lead for the W80-4 Life Extension Program. He manages Sandia DA program funding, develops cost targets for project realization teams, leads the pre-Performance Measurement Baseline Change Control Board, and owns internal and external financial reporting. Prior to Sandia, he worked as a Sr. Data Analyst for PayPal and Safeway, Inc. Nathan managed analytics on PayPal's largest merchant—eBay Inc.—optimized product adoption flow, utilized customer data to develop customized offers and targeting strategies, and helped to develop the national fuel loyalty strategy for Safeway Inc. Nathan Clough holds an M.S. in Agricultural and Resource Economics and a B.S. in Managerial Economics from the University of California, Davis.

Nathan will be presenting with Christopher Nesbit on the following topic –

Quick, Consistent, and Relevant Capital Investment Programming Level Budget Estimates

Leveraging data available at DOE, NNSA, industry and subject matter expertise, Sandia has developed a consistent methodology for establishing early site developed point estimates. This bottoms-up estimating methodology, presented at previous CECOP conferences, has been updated to include Monte Carlo Simulation to inform the uncertainty aspects of developing early notional estimates.

ANDREA DORADO - SNL, SYSTEMS ANALYST

- Andrea will be presenting on the following topic -

Cost Estimating Informed by Design

This presentation will focus on an alternative systems engineering architecture, Model Based Systems Engineering, and the benefits it may provide to nuclear deterrence modernization program cost estimating and analysis efforts across the Nuclear Security Enterprise.

2020 CECOP SYMPOSIUM

Andrea currently conducts systems research and analysis for the Nuclear Security Enterprise and Cost Analysis department at Sandia National Laboratories (SNL). She was initially hired into the Access Delay and Structural Assessment Department at SNL as their materials Subject Matter Expert. She represented her Center as a member of the Weapon Intern Program class of 2019. Andrea's background is in materials science and engineering with a B.S. from Arizona State University and an M.S. from Stanford University.

PRESENTERS



MICHAEL EMMONS. PH.D. - LLNL. W80-4 ENGINEERING TEAM

Michael serves as the Warhead Assessments Lead on the W80-4 Engineering Team at Lawrence Livermore National Laboratory (LLNL). He oversees the body of engineering tests and analyses that will be used for design qualification and system certification. In addition to his technical role, Michael is the Control Account Manager for system-level engineering tests and analysis, Production Agency hardware procurements, and Joint Test Assembly development. In his seven years at LLNL, he has run large scale tests and led a research and development portfolio on utilizing embedded sensors in the stockpile. Michael received his B.S., M.S., and Ph.D. in Mechanical Engineering from UCLA.

Michael will be presenting on the following topic ——

Creating and Maintaining a Material Requirements Schedule

In 2018, Lawrence Livermore National Laboratory completed its first Weapon Design & Cost Report since the W80-3 Life Extension Program nearly twenty years ago. Mike's talk describes the process and lessons learned in creating and maintaining LLNL's inaugural Material Requirements Schedule.



ROBERT FATZINGER — NNSA NA-MB CONTRACTOR, SENIOR TECHNICAL ADVISOR

Robert is a skilled program manager and cost estimator bringing a unique combination of Federal Acquisition experience from both government and industry. He is a Certified Estimating Professional and Project Management Professional, as well as a licensed Certified Public Accountant in Virginia. Robert currently supports NA-MB-90 in the deployment of financial analysis systems and development of cost, schedule, and risk analysis. His industry experience includes direct participation in Department of Homeland Security major acquisition programs, major acquisitions in the Intelligence Community, and U.S. Navy nuclear shipbuilding and repair. As a contractor, Robert served as Program Manager of TSA's \$500M Passenger Screening Program Integrated Logistics Support. He

previously served on the CIA's Office of the Inspector General audit team assigned to independently review the cost schedule and technical performance of large classified acquisition programs. Robert also worked in planning, scheduling, and material supply on the first two Nimitz Class Aircraft Carrier refueling and complex overhaul contracts at Newport News Shipbuilding.

Robert will be presenting on the following topic

The Lewis and Clark Expedition's Integrated Cost, Schedule, and Risk Analysis

Robert asks, "Would the application of historical data and integrated cost, schedule, and risk analysis have improved the reliability of Thomas Jefferson's initial estimate for the Lewis and Clark expedition in 1803?" This presentation will examine the application of AACE Recommended Practice 57R-09 to more common, phase-gate projects of moderate size, scope and complexity through lightweight and flexible Microsoft Excel modeling using the lens of the Lewis and Clark Expedition.

PRESENTERS

FANA GEBEYEHU-HOUSTON - NNSA NA-MB-83. OFFICE OF FIELD MATRIX SUPPORT



Fana is currently establishing the NNSA Office of Field Matrix Support in

development of the NNSA Planning, Programming, Budgeting, and Evaluation Realignment Initiative. Previously, she established an independent cost estimating and analysis organization for the United States nuclear weapons program. This effort has received recognition for transparency and effectiveness from National Laboratories, the Deputy Administrator for Defense Programs, the Office of Management and Budget, and the Government Accountability Office. Her office's technical approach to long-range forecasting of nuclear stockpile costs headlined the September/October 2015 Cost Engineering Journal of the Association for the Advancement of Cost Engineering. Fana has spent her federal career implementing transparency and program management initiatives for the federal government.

Fana will be presenting on the following topic —

A Model for Cost Optimizations and CAIV - Paradigms for Parametric Estimating

This presentation will explore the value of parametric estimating in identifying key design parameters that drive costs. The Material Staging Facility is a potential Hazard Category 2 facility being proposed for construction at the Pantex Plant in Amarillo, Texas. The CD-0 estimate provides a case study in identifying key design parameters that will drive cost performance.

LEE HORNSBY, M.B.A - LANL, PROGRAM MANAGER



Lee is a Program Manager for the B61-12 Life Extension Program directly supporting the Local Test Portfolio, as well as supporting Associate Laboratory Directorate for Weapons (ALDW) in the Hydrodynamic Experimental Portfolio at Los Alamos National Laboratory (LANL). Lee has over eight years' work experience supporting NNSA Laboratories with five years directly supporting LANL and three years supporting Sandia National Laboratories on the B61-12 JTA portfolio. His expertise includes scheduling, estimating, program integration, risk analysis and earn value management. In his current role, Lee is responsible for supporting the ALDW-PO estimating initiative to develop and review all weapons program estimates on behalf of ALDW. Lee has an M.B.A. with a concentration in Finance, a B.B.A. with a concentration in Accounting and professional certifications in P6, Earned Value Management Systems and Acumen Fuse Analytics.

LANL Weapons Program Estimating Approach

This presentation will review LANL's approach to standardizing a Work Breakdown Structure for all new work to ensure consistency in estimating approach. Including the use of historical data and utilization of Technical Subject Matter Experts to support bottoms-up estimating, this presentation is intended to share the lessons learned and applied from previous weapons program to help define an improved approach to estimating.

2020 CECOP SYMPOSIUM

– Lee will be presenting with Danny Salazar on the following topic

PRESENTERS



TERRY JOSSERAND – SNL. PRINCIPAL ANALYST

Terry is a Principal Analyst for the Nuclear Security Enterprise and Cost Analysis department at Sandia National Laboratories. Over the past ten years, Terry has been involved in developing and reviewing estimates and analyses for nuclear weapon systems, secure transportation assets, satellite programs, and many other national security efforts.

Terry will be presenting on the following topic —

A Technical Solution to Preserving Historical Nuclear Weapon Modernization Program Data

Terry asks, "What process does your organization utilize to capture and maintain the relationship of traceable nuclear weapon modernization program lifecycle scope and cost data?" His presentation will address some of the challenges, present the architecture of the technical solution, and describe the path forward on this journey of preserving historical nuclear weapon modernization data.



KAYEE LEUNG - NNSA NA-MB-92, PROJECT MANAGER

Kayee has over 10 years' experience in project management, process improvement, policy definition and analysis for various government agencies. She is currently a project manager contractor with NA-MB-92 Office of Analysis and Evaluation. She provides programmatic and operational support to a portfolio of Analysis of Alternatives worth over \$20 billion in capital acquisition and the development of the NNSA Defense Program's 25 Year Infrastructure Capital Acquisition portfolio. Prior to NNSA, Kayee worked for Technomics and then IBM as an Operations and Supply Chain Management Senior Consultant. Kayee holds a Project Management Professional certification from the Project Management Institute, Certified Supply Chain Professional certification from

American Production and Inventory Control Society, and DOE Lean Six Sigma Greenbelt certification.

Kayee is presenting with Charles Loelius on the following topic —

DOE O 413.3B NPR Implementation Plan Efficiency Study

This presentation will review the study results focusing on the NNSA acquisition policy implementation efficiencies, inefficiencies, and recommendations that could support the delivery of infrastructure modernization faster and more affordably to support the long-term success of the DOE and NNSA's capital acquisitions.

PRESENTERS



CHARLES LOELIUS. PH.D. - NNSA NA-MB-922 DIVISION MANAGER

Rutgers University.

CSPER-C Model

This presentation will provide an overview of Cost, Schedule, and Phasing Estimation Relationships for Construction (CSPER-C) that NA-MB-92 has developed to support long term capital planning. His discussion will describe the basis of the model in actual costs, schedules, and profiles from NNSA projects, followed by an outline of the estimating relationships and the key cost and schedule drivers. Recent and future updates to the model will then be presented for discussion.

DOE O 413.3B NPR Implementation Plan Efficiency Study

Charlie and Kayee will review the study results focusing on the NNSA acquisition policy implementation efficiencies, inefficiencies, and recommendations that could support the delivery of infrastructure modernization faster and more affordably to support the long-term success of the DOE and NNSA's capital acquisitions.



Chris is a Strategic Partnership Planner in the Facilities organization and has served at Sandia National Laboratories for the last six years. The Site Planning and Partnership department works with Program and Line Subject Matter Experts to evaluate the gaps between the program objectives and current state of health, propose strategic roadmaps of investments, and develop associated cost proposals for capability investment recommendations to NNSA, DOE, and other Federal sponsors. Chris is a Licensed and Registered Architect with over 25 years of experience and 15 years focused on science, technology, and government building sectors.

Chris will be presenting with Nathan Clough on the following topic —

Quick, Consistent, and Relevant Capital Investment Programming Level Budget Estimates

Leveraging data available at DOE, NNSA, industry and subject matter expertise, Sandia has developed a consistent methodology for establishing early site developed point estimates. This bottoms-up estimating methodology, presented at previous CECOP conferences, has been updated to include Monte Carlo Simulation to inform the uncertainty aspects of developing early notional estimates.

2020 CECOP SYMPOSIUM

Charlie is a Division Manager for Enterprise Modeling and Policy within the National Nuclear Security Administration's Office of Management and Budget. He completed his Ph.D. in experimental nuclear physics at Michigan State University in 2017 and joined NNSA in the same year as a member of the NNSA Graduate Fellowship Program. Charlie also holds a B.S. in philosophy, physics, and mathematics from



CHRISTOPHER T. NESBIT — SNL, STRATEGIC SITE PLANNER

PRESENTERS



TODD JAMES PROFFITT – LANL, DEPUTY MANAGER OF ESTIMATING

Todd is engaged with the development and maintenance of the Estimating Department's software tools and procedures at Los Alamos National Laboratory (LANL), also coordinating the department's workload and review cycle. He leverages relationships with Project Controls and Acquisition Services to increase synergy between departments, increasing efficiency, cost effectiveness and the quality of LANL's Estimating Department's product. Todd is an experienced cost estimator with 35 years of construction experience. Having served in roles ranging from a laborer in the field, to representing owners on major commercial office building projects, there is no aspect of the construction industry that he has not experienced.

Todd will be presenting on the following topic ——

Capital Acquisition Planning and Estimating

This presentation will provide an overview of how LANL estimating supports the capital acquisition process. Meeting the needs of the project teams is not the only requirement of an estimate, but this presentation will demonstrate how this procedure meets the requirements of the DOE and the GAO.



DANNY R. SALAZAR , M.B.A., PMP- LANL, PROGRAM MANAGER

Danny is Program Manager for the Weapons Engineering Directorate supporting the Program Integration and Weapons Modernization Programs at Los Alamos National Laboratory (LANL). In his current role, Danny is responsible for leading the Associate Laboratory Director for Weapons (ALDW) Engineering-Program Office estimating initiative to develop and review all weapons program estimates on behalf of ALDW. He has over 18 years work experience at LANL in Weapons, Quality, Operations, and Manufacturing. In addition to his service at LANL, Danny also has Construction and Project Management experience in private and commercial industries. His expertise includes program integration, scheduling, estimating, risk analysis and earn value management on various programs

and projects. Danny holds an M.B.A. and a B.S. in Mechanical Engineering and is also a certified Project Management Professional.

Danny will be presenting with Lee Hornsby on the following topic —

LANL Weapons Program Estimating Approach

This presentation will review LANL's approach to standardizing a Work Breakdown Structure for all new work to ensure consistency in estimating approach. Including the use of historical data and utilization of Technical Subject Matter Experts to support bottoms-up estimating, this presentation is intended to share the lessons learned and applied from previous weapons program to help define an improved approach to estimating.

PRESENTERS



Jonell is a Principal Member of the Technical staff within the Nuclear Security Enterprise and Cost Analysis Department at Sandia National Laboratories (SNL). Since 2013, she has been assisting key stakeholders with their decisions in the areas of strategic nuclear weapon stockpile planning, cost analysis and estimating, tritium and special commodities, and nuclear security enterprise wide planning. Jonell is an active member of several groups at SNL and the Military Operations Research Society (MORS). She is currently the Junior Analyst Ambassador Advisory Director for MORS. Jonell holds a Ph.D. in Analytical Chemistry from Purdue University and a B.S. in Chemistry from the University of Illinois at Urbana-Champaign.

Jonell will be presenting on the following topic —

Working Toward Mitigating Cognitive Biases in Analogous-Based Cost Estimating Models

The ability to measure and assess the influence that cognitive biases have regarding SME inputs for complexity estimates is challenging. Jonell will first discuss a modified Estimate Input Checklist and Maturity Matrix for nuclear warheads and will then apply this checklist to the quantitative assessment of the SME complexity estimates to see if they fall within the expected range given a program's level of maturity.



BEN TRUSKIN — TECHNOMICS, INC., NATIONAL RECONNAISSANCE OFFICE

Ben is a Certified Cost Estimator/Analyst supporting multiple teams within the National Reconnaissance Office (NRO) Cost and Acquisition Assessment Group (CAAG). He has a diverse set of responsibilities at the CAAG which include developing cost estimates, analysis of alternatives, source selection analysis, data collection and normalization, industry outreach, methods development, cost model development, data visualization, and requirements generation. Ben has been with Technomics for three years, supporting the CAAG as a client for the past six years. Prior to his work at the CAAG, he was a research assistant at the Air Vehicle Intelligence and Autonomy laboratory at Pennsylvania State University. Ben received an M.S and B.S. from Penn State.

 Ben will be presenting with an introduction by Keynote Speaker — Jennifer Rose on the following topic

Realistic Cost Estimates (RCEs): The NRO's Innovative Pilot Program for Contract Cost Evaluation

The NRO is piloting a new approach to awarding spacecraft acquisition contracts. This presentation delves into how cost estimators tackled assessment of cost realism, and documents the mathematical and social challenges surmounted in applying this to several large pilot source selections.

2020 CECOP SYMPOSIUM

JONELL N. SAMBERSON, PH.D. - SNL, PRINCIPAL MEMBER OF THE TECHNICAL STAFF

PRESENTERS



ANDREW ZOBAY – LANL, PROJECT CONTROLS

Andrew serves as Project Controls Manager for the Los Alamos National Laboratory Production Agency, where he manages a team of over 30 Project Controls Engineers. With the NNSA and NASA as primary external customers, Andrew's portfolio consists of Programs such as Plutonium Sustainment, W80-4, W88 Alt 370, B61-12, ARIES, Directed Stockpile Work, Radioisotope Power Systems, and others.

Andrew has over 18 years' experience in Project Controls, supporting Project Management endeavors in nuclear power generation, engineering, Environmental Management, and numerous NNSA funded programs. Prior to entering the Project Management/Controls arena, Andrew was a schoolteacher and holds an M.S. in Education.

Andrew will be presenting on the following topic ——

Comprehensive Records and Estimating System

This presentation will address the Comprehensive Records and Estimating System (CRES) as a suite of tools that help define scope and cost for work packages and integrate P6 scheduling data. The CRES database provides shared access between different project roles and automates and standardizes several Project Management related functions.

Acronym	Definition
AACE	Association for the Advanceme
AC	Actual Cost
ADS	Activity Data Sheet (EPAT)
AFP	Approved Funding Program
AHJ	Authority Having Jurisdiction
AI	Artificial Intelligence
ALDW	Associate Laboratory Directora
ALDW-PO	Associate Laboratory Directora
AoA	Analysis of Alternatives
ARM	Active Risk Manager
BLCR	Baseline Cost Report
BOE	Basis of Estimate
вор	Business Operating Policy
CAM	Control Account Manager
CAAG	Cost and Acquisition Assessme
CADE	Cost Assessment Data Enterpr
СВС	Cincinnati Business Center
CCEA	Certified Cost Estimator/Analy
ССР	Certified Cost Professional
CEAG	Cost Estimation Ar, sis Group
CEBoK®	Cost Estimating Body of Knowl
CECOP	Cost Estimating Community of
CEG	Cost Execution Guidance
CEP	Certified Estimating Profession
CEPE	Cost Estimation and Program E
CER	Cost Estimating Relationship
CFO	Chief Financial Officer
СММ	Capability Maturity Model
COTS	Commercial Off The Shelf
СРА	Certified Public Accountant
CR	Continuing Resolution
CRA	Cost Risk Analysis
CRF	Cost Review Framework
CRES	Comprehensive Records and E
CSPER-C	Cost, Schedule, and Phasing Es
CUA	Cost Uncertainty Analysis
CURA	Cost Uncertainty and Risk Ana
DA	Design Agency
DBSE	Documents Based Systems Eng

2020	CECOP	SYMPO	SIUM

ent of Cost Engine	eering		
te for Weapons			
te for Weapons-	Program Office	9	
	, in the second s		
nt Group			
se			
st			
edge			
Practice			
al			
valuation			
timating System			
timation Relation	ships for Cons	truction	
ysis			
ineering			

Acronym	Definition
DP	Defense Programs
DPBPS	Defense Programs Business Process System
DS	Decision Support
DSW	Directed Stockpile Work
EAC	Estimate at Completion (also known as Total Cost)
EM	Environmental Management
EOC	Elements of Cost
EPAT	Enterprise Portfolio and Analysis Tool
EPIC-R	Engineering Program Internal Change – Request
ES&H	Environment, Safety and Health
ETC	Estimate to Complete (also known as Remaining Cost)
EVM	Earned Value Management
EVMS	Earned Value Management System
EVP	Earned Value Professional
EVT	Earned Value Type
FAR	Federal Acquisition Regulation
FM&T	Federal Manufacturing & Technologies
FPM	Federal Program Manager
FPO	Federal Program Office
FY	Fiscal Year
FYNSP	Future Years Nuclear Security Program
GAO	Government Accounting Office
GOCO	Government Owned, Contractor Operated (Facilities)
GPP	General Plant Projects
GWBS	Government Work Breakdown Structure
IBR	Integrated Baseline Review
IC	Integrated Contractors
ICE	Independent Cost Estimate
ICEAA	International Cost Estimating and Analysis Association
ICR	Independent Cost Review
IFMS	Integrated Financial Management System
IP	Implementation Plans
IPL	Integrated Priority Lists
IT	Information Technology
ATL	Joint Test Assemblies
KCNSC	Kansas City National Security Campus
LANL	Los Alamos National Laboratory
LCCE	Life Cycle Cost Estimate
LEP	Life Extension Program

Acronym	Definition
LLNL	Lawrence Livermore National Laboratory
LOE	Level of Effort
M&O	Management and Operations
MBSE	Model Based System Engineering
ML	Machine Learning
MORS	Military Operations Research Society
MRS	Material Requirements Schedule
MTS	Machine Tool Services
NA-194	NNSA Office of Non-Nuclear Components
NA-APM	NNSA Office of Acquisition and Project Management
NA-MB	NNSA Office of Management and Budget
NA-MB-92	NNSA Office of Analysis and Evaluation
NDAA	National Defense Authorization Act
NMSU	New Mexico State University
NNSA	National Nuclear Security Administration
NPR	Nuclear Posture Review
NQA	Nuclear Quality Assurance
NRO	National Reconnaissance Office
NSE	Nuclear Security Enterprise
NVA	Non Value Add
NWAP	Nuclear Weapons Acquisition Professional
NWBS	NNSA Work Breakdown Structure
NWC	Nuclear Weapons Council
0&S	Operating and Support
OCL	Obligational Control Level
омв	Office of Management and Budget
OPM	Office of Personnel Management
OSD	Office of Secretary of Defense
P&PD	Planning and Programming Directive
РА	Production Agency
PDM	Program Decision Memorandum
PE	Project Engineer
PM	Program Management
РМВ	Program Management Baseline
PMI	Project Management Institute
PMI-ACP	PMI-Agile Certified Practitioner
РМО	Program Management Office
РМР	Project Management Professional

2020 CECOP SYMPOSIUM

Acronym	Definition
PPBE	Planning, Programming, Budgeting and Evaluation
PPFG	Planning, Programming and Fiscal Guidance
PRT	Product Realization Team
PSP	Planning and Scheduling Professional
PT&C	Project, Time & Cost
PWS	Performance Work Statement
РХ	Pantex
QRA	Quantitative Risk Analysis
R&D	Research and Development
RBA	Risk & Benefit Analysis
RFP	Request for Proposal
RIMS	The Risk Management Society
RIMS-CRMP	RIMS Certified Risk Management Professional
ROTs	Requirements over Target (aka Unfunded Requirements)
SA	Summary Account
SCORE	Scope, Complexity, Options, Risks, Excursions
SCURA	Schedule and Cost Uncertainty and Risk Analysis
SER	Schedule Estimating Relationship
SGA	Strategic Gap Analysis
SME	Subject Matter Expert
SNL	Sandia National Laboratories
SOW	Statement of Work
SRS	Savannah River Site
SRTE	Savannah River Tritium Enterprise
SSMP	Stockpile Stewardship Management Plan
TAC	Total Available to Cost (or New Budget Authority plus prior year Uncosted Obligations)
TCMF	Total Cost Management Framework
тос	Total Ownership Cost
TRA	Technology Readiness Assessment
USAF	United States Air Force
USCG	United States Coast Guard
USMC	United States Marine Corps
USN	United States Navy
VOC	Voice of Customer
WA	Work Authorizations
WBS	Work Breakdown Structure
WDCR	Weapon Design and Cost Report
WIP	Weapon Intern Program

The Fifth Annual CECOP Symposium will be held at Los Alamos National Laboratory in Los Alamos, New Mexico in August 2021



Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of NTESS, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04 94AL85000.

WORKING TOGETHER: ONE MISSION, ONE VISION, ONE NSE

2020 CECOP SYMPOSIUM

ANNOUCEMENTS

CECOP SYMPOSIUM 2021





