
LONGENECKER and ASSOCIATES

James M. Broughton

EXPERIENCE SUMMARY

Mr. Broughton has more than 35 years experience in developing, planning and executing nuclear programs for DOE and NRC and providing consulting services to DOE and its contractors. His primary work experience includes reactor safety research at the INL, design and engineering development of the New Production Reactors, and consulting to the Department of Energy and its contractors on technical and management issues related to nuclear engineering, operations and safety across the DOE complex. Mr. Broughton is currently providing consulting services that include: Program/Project Management; strategic and program planning and analysis; resource planning and allocation; configuration management and change control; work definition, planning and control; systems engineering; nuclear design development and review; nuclear safety assurance including ISM implementation; and management and conduct-of-operations assessments. He has also had responsible for Government/International Programs and interfaces.

DETAILED EXPERIENCE

Since 1997, Mr. Broughton has provided consulting services in support of projects, programs and operations at Argonne National Laboratory-West, Rocky Flats Plant, Los Alamos National Laboratory, and the DOE Program Offices for Commercial Light Water Reactor Tritium Production and Plutonium Disposition. Mr. Broughton's primary consulting assignments have included: Program Manager for Equipment Design, Installation and Maintenance for LANL's Pit Manufacturing Program (2006 to Present); Executive Secretary of Blue Ribbon Panel for assessment of LANL's DynEx Program; Chairman of the Technical Advisory Group for LANL's Materials and Manufacturing Program (1997 to 1999); Chairman of the Red Team review of the detailed design of the Tritium Extraction Facility at Savannah River Site for DOE's CLWR Tritium Production Program; member of the Red Team for DOE's Plutonium Disposition Program; Co-chairman of the Red Team review of the RFETS 10-year closure plan; performed an assessment of conduct-of-operations and implementation of Integrated Safety Management at ANL-W; and Chaired other review/assessment teams including Chairman of the Independent Assessment of the Bostomatic CNC Mill off normal incident of January 27, 2004, Chairman of the Independent Assessment of the Plutonium Intake Event in PF-4 Room 319, and Chairman of the independent assessment of LANL 94-1 Implementation Plan.

From July 2004 to January 2007, Mr. Broughton provided full time support to the Pit Manufacturing Program (PMP) at LANL. The PMP has the mission to manufacture the Pits for the nuclear weapons in the Nations enduring stockpile. This support has included technical, conduct of operations, conduct of engineering, safety and program/project management support. His primary responsibility since June 2006 is the design, installation and maintenance of all pit manufacturing process systems and equipment, approximately \$30M annual budget. In addition, he also provides services on (1) programmatic and project planning, and baseline assessment and validation, (2) establishing project management systems and infrastructure, (3) independent readiness reviews and assessmentz, (4) independent safety review, (5) assessment, development and implementation of conduct-of-engineering and -operations; and (6) mentors technical and project management staff.

For approximately five years from 1992 until 1997 Mr. Broughton was a senior manager or executive of several prominent Engineering and Construction Companies that provide environmental, engineering, construction, and technical support services to DOE and its contractors.

Mr. Broughton is the former Deputy Director/Chief Engineer for DOE's New Production Reactors

Program from 1990 until 1992. He was responsible for the design, testing and startup, and requisite technology development of the three reactor technologies proposed to provide tritium production capability on a fast track. Two of the reactor types were to be designed and construction to NRC licensing standards. Mr. Broughton was responsible for: the life-cycle cost, schedule, and milestone baseline; reactor(s) design and technology base including advanced safety concepts, nuclear fuel, tritium targets, and operational concepts. He ensured that all design and related technical aspects of the Program were fully integrated and consistent with DOE requirements and standards.

Mr. Broughton had numerous technical and management assignments at the INL from 1972 until 1990 culminating as Group Manager, Nuclear Reactor Research and Technology. During his tenure at the INL he was responsible for various nuclear reactor safety programs including DOE's Severe Accident Research Program, the TMI-2 Accident Evaluation Program, OECD/LOFT Extended Analysis Program, and various Power Burst Facility (PBF) nuclear fuels safety research programs. He was responsible for all aspect of program planning, funding and execution including directing the activities of up to 100 senior scientists and engineers. Major accomplishments included: design, fabrication and qualification of specialized tools to de-fuel TMI-2; developed the TMI-2 accident scenario and NRC's standard problem; supported TMI-2 de-fueling and D&D operations; and over 20 NRC fuel behavior safety tests in the PBF including data analysis, test results reporting, and application to NRC licensing and regulatory safety issues.

Attached is a summary of "Noteworthy Career Assignments and Accomplishments" that provides specific examples documenting Mr. Broughton's professional qualifications and work experience.

EDUCATION

BS/MS Mechanical Engineering, Colorado State University, 1970/1972

PROFESSIONAL DEVELOPMENT AND ACHIEVEMENTS

Special Training Courses, Seminars and Workshops include:

- Managing Interpersonal Relationships
- Quality Education System for the Individual
- Managing Quality Improvement
- Creating High Performance Teams
- The EG&G Manager
- Personnel Management for Supervisors
- Equal Employment Opportunity
- Government Program Management
- Contract Administration for Technical Representatives
- Two-Phase Flow Measurements
- Two-Phase Flow and Heat Transfer
- Experimental Methods in Thermoscience
- Two-Phase Flow Phenomena
- LWR Fuel Rod Behavior

Author/Co-author of 60 technical papers and reports.

PROFESSIONAL MEMBERSHIPS

- Pi Tau Sigma, Honorary Mechanical Engineering Fraternity, December 1969
- American Nuclear Society
- American Society of Mechanical Engineers

AWARDS AND RECOGNITION

- Certificate of Appreciation, MIT Nuclear Engineering Department, April 11, 1988
- Award of Excellence for significant contribution to the Stockpile Stewardship Program, NNSA Defense Programs, December 2007
- NNSA Bronze Medal, December 2007

SECURITY CLEARANCE

DOE "Q" and "HRP"

Attachment: Noteworthy Career Assignments and Accomplishments

Attachment:**NOTEWORTHY CAREER ASSIGNMENTS AND ACCOMPLISHMENTS
FOR
JAMES M BROUGHTON****Management/Technical Positions**

- Program Manager for Equipment Design, Installation and Maintenance, LANL Pit Manufacturing Program – 6/2006-Present
- Founder, President and CEO of Applied Engineering Services, Inc. – 5/97-Present
- Vice President, DOE Program Strategic Initiatives, ICF Kaiser – 2/96-4/97
- Senior Program Director, Parsons Corporation – 1994-1996
- Director Government Operations, Nuclear Utilities Services; Director DOE Business Development, Nuclear Utilities Services; and Director DOE Business Development, Brown & Root Environmental – 1992-1994
- Deputy Director and Chief Engineer of the DOE New Production Reactors (NPR) Program, member of Senior Executive Service – 1990-1992
- Group Manager, EG&G Idaho Inc, Idaho National Engineering Laboratory – 1982-1989
- Senior Engineer/Engineer, EG&G Idaho Inc., Idaho National Engineer Laboratory – 1972-1982

Program/Project Technical and Management Accomplishments

- Responsible for leadership and management of the design and installation of Pit Manufacturing systems and equipment, achieving for the first time, all Level 2 Program milestones in FY-06 and -07, with an annual budget of ~\$16M.
- Program Manager responsible for the definition, development and implementation of an effective Project Management/Engineering Group responsible for the design and installation of pit manufacturing systems and equipment in PF-4.
- Responsible for leadership and management of the development and baselining of the element of the Pit Manufacturing Plan to upgrade/reconfigure the LANL Plutonium Facility (PR-4/TA-55) to manufacture all of the Pits in the Nations enduring nuclear weapons stockpile. The Plan's scope is approximately 10 years and in excess of \$1B.
- Responsible for development and implementation of the Pit Manufacturing Preventive Maintenance Program with an annual budget of ~\$13M – the program is compliant with DOE Order 433.1.
- Conceptualized, co-authored and provided primary leadership and responsibility for the development and implementation of the Pit Manufacturing Life-Cycle Guide for Pit Manufacturing Systems and Equipment – the Guide is compliant with DOE Order 413.1a
- Conceptualized and co-author of the LANL Pit Manufacturing Guide for Development and Implementation of the Preventive Maintenance Programs – the guide is compliant with DOE Order 433.1. The Guide provides the basis for the Pit Manufacturing PM Program.
- As NPR Chief Engineer responsible for Program technical baselines and conceptual designs for the HWR and MHTGR new production reactors.
- As NPR Chief Engineer, responsible for technical scope and execution of the NPR Technology Development Program for all three production reactor concepts required to provide the necessary technical data for licensing of the NPRs – compliant with NRC technical requirement for licensing Nuclear Reactors (circa 1990)

- DOE Project Manager responsible for the LWR Tritium Target Program as a third reactor technology alternative for tritium production. This LWR tritium target is the Nations current technology for Tritium production.
- Defined, developed and managed the TMI-2 Accident Evaluation Program. Developed the TMI-2 accident scenario and provided the NRC TMI-2 standard problem for severe accident code verification and validation.
- Defined, developed, executed and reported NRC design basis and severe accident programs at the INEL in the PBF reactor.
- NRC/DOE program technical representative for five international reactor safety programs: NRC Severe Accident Fuel Behavior, TMI-2 Accident Evaluation, OECD/LOFT Extended Analysis, PBF nuclear fuels safety tests, and Halden fuel-cladding gap heat transfer.
- Author/co-author of sixty (60) technical papers and reports, including "A Scenario of the Three Mile Island Unit 2 Accident," Nuclear Technology, Vol 87, No. 1, August 1989.

Independent Management Assessments

- Chaired the independent assessment of the Bostomatic CNC Mill and GB-388 off normal incident of January 27, 2004 and provided report with recommendations for enhanced safety in operations.
- Chaired the NMT independent assessment and provided the report "Assessment of Plutonium Intake Event in PF-4, Room 319 on March 13, 2002" including recommendations for improved safety in operations.
- Member the NMT Management Self-Assessment Team for Facilities and Infrastructure with co-responsibility for assessment of Configuration Management in preparation for PF-4/TA-55 resumption of operations. Identified findings and requirements for pre-start and post-start correction consistent with DOE Order 430.1, DOE-STD-1073-93 and 10 CFR 830.
- Developed checklist for restart of process operations in the TA-55 Plutonium Facility (PF-4) following resumption of Facility operations discussed in preceding bullet.
- Executive Secretary of the LANL's Blue Ribbon Panel charters to provide independent management assessment of the DynEx Program. The BRPs objectives were to mentor LANL Program staff on conduct of operations and safety, and to independently assess the Program and provide the necessary data to LANL and NNSA senior management demonstrating that experiments could be conducted safely and in compliance with environmental requirements.
- As Chairman of LANL's Nuclear Component Readiness Program executed numerous management assessments including 1) readiness of the NMT Fire Water Loop Project to Proceed with Construction, 2) NCR organizational roles and responsibilities, 3) projectization of the NCR Program, 4) functional and management approach to pit manufacturing, 5) manufacturing infrastructure required to support pit manufacturing at LANL, and 5) the NCR Quality Assurance Program.
- Member of the DOE Materials Disposition Program Senior Technical Advisory Group providing independent assessment and review of the MOX Fuel Fabrication Facility Design and approach to safety.
- Chairman of the DOE DP-25 implementation assessment team of the LANL 94-1 Implementation Plan for Plutonium residue management and disposition.
- Performed an assessment of conduct of operations and management at ANL-W. Assignments included:
 - Assessment of the Database for Improvement Opportunity Tracking (DIOT) System

- Assessment and “Report of the Independent Assessment of ANL-W Hazards Identification and Mitigation Pertaining to Lost Time Accidents and Restricted Work Day Cases”
- Assessment of the technical maturity of the proposed high temperature co-generation reactor at the INL
- Developed and drafted the ANL-W Site Management Plan
- Conducted extensive operational walkdowns and assessments of all major ANL-W facilities including numerous staff interviews. Provided written report to ANL-W management of findings and recommendations for improved safety and rigor in operations.

Conduct of:

Engineering

- Life Cycle Guide for Pit Manufacturing Systems and Equipment: A technical and management guide for development, design and installation, and testing, startup and turn-over to operations of pit manufacturing systems and equipment. Includes format and content guides for all major deliverables throughout the system’s life-cycle. Provided the leadership and management of the implementation of the Life-Cycle Guide across the scope of Pit Manufacturing operations.
- Member of the Pit Manufacturing Change Control Board chartered to baselining and control changes to the Pit Manufacturing technical baseline.
- Member of the LANS TA-55 (Plutonium) Facility Team for the development and implementation of Conduct of Engineering.
- Via the Dynex Blue Ribbon Panel, provided technical guidance and leadership to the Dynex Program in the development and establishment of a Conduct of Engineering Program and implementing procedures including the “design standard” and appropriate design and quality infrastructure to support successful and safe project execution.
- Developed the (Hanford) Tank Farm Transition Projects (TFTP) System Engineering Management Guidelines
- Developed the River Protection Project (RPP) Interface Management Directive.
- Chairman of the NPR Change Control Board chartered to baseline and control changes to the NPR design configurations.

Operations

- Provided the leadership and technical and implementation guidance in the development and implementation of the Pit Manufacturing Plan of the Day, and Work Planning and Control for pit manufacturing in the Plutonium facility, PF-4. Program elements are compliant with DOE Orders and Guides.
- Mentored the NMT-5 Group in the implementation of a rigorous approach to control and execution of Plutonium operations in the manufacture of Pits. Compliance with all DOE and 10 CFR 830 safety requirements was a significant element.
- Chaired/Performed management self-assessments of operational incidents or abnormal events for LANL Pit Manufacturing Operations providing numerous recommendations for improved safety and more rigorous conduct of operations.

Maintenance

- Provided the leadership and management in the development, implementation and execution of the Pit Manufacturing Preventive Maintenance Program. The Program is compliant with DOE Order 433.1.
- PM Programs were developed and implemented on more than fifty (50) pit manufacturing process systems including three (3) safety significant process systems. DOE reviewed and approved the PM Programs for the safety significant systems.

Consulting

- Chairman of the LANL Technical Advisory Group (TAG) for the Nuclear Weapons Materials and Manufacturing Program. The Program's mission was to reestablish the Nations capability to manufacture nuclear weapons Pits and provide the necessary systems and equipment for pit manufacturing. The TAG executed numerous tasks and assessments for the Program including management assessments; design, baseline and readiness reviews; defined project documentation requirements; and assisted project personnel with development and implementation of the Program.
- Member of the LANL team that prepared the Integrated Plan for Pit Manufacturing and Certification providing advice, recommendations and preparation support regarding plan content, structure and integration of Program elements.
- Member and Executive Secretary of the LANL Blue Ribbon Panel (BRP) performing an independent safety (and management) assessment of a project to confine high explosive detonations in spherical steel vessels. The BRP was instrumental in assisting the Project develop a "design standard" for confinement and an appropriate quality, engineering and operational infrastructure to support safe project execution. Mentored Project technical and management staff on Conduct of Engineering and Operations including Safety and Quality.
- Mentored the NMT Division Director, NMT-5 Group Leader and the Project Leader for Pit Manufacturing Operations on Conduct of Engineering, Operations and Maintenance.
- Member of the DOE design review team for the Conceptual design of the DOE's Tritium Extraction Facility to be sited at the Savannah River Site.
- Chairman of the Design Review Team of the Tritium Extraction Facility Title II design. The Red Team provided detailed design comments and recommendations to DOE and SRS Contractor.
- Chairman of the DOE DP-25 implementation assessment team of the LANL 94-1 Implementation Plan for Plutonium residue management and disposition.
- For Kaiser-Hill, provided white papers on "Organizational Options for More Effective Projectization of the Rocky Flats Environmental Technology Site", "Resource Utilization and Project Controls and Reporting", and "Role of the Integrator"
- Member of the Kaiser-Hill (K-H) Planning and Integration Team that developed the first site-wide integrated plan for the Rocky Flats Closure Project.
- Co-chairman of the Kaiser-Hill Red Team providing detailed review and recommendations for improvement of the 2010 Rocky Flats Closure Project Plan.
- Assisted the K-H Planning and Integration Team develop the RFETS closure strategy for site closure in 2006. Developed key elements of the strategy that permitted K-H to compress the site schedule closure by 4-years.

Business Development

- Primary architect and co-author of Parsons' technical and management approach and co-author of the ES&H approach proposed to DOE for the Integration and Management Contract at Rocky Flats. The Source Evaluation Board rated the approaches as "outstanding" and "excellent" respectively.
- Co-author of Raytheon's technical and management approach proposed for the Management and Integration Contract at the Hanford site. The Source Evaluation Board rated the approach as "excellent".
- Corporate responsibility for acquisition of more than \$15 million in DOE technical support service contracts.
- Post Red Team Proposal Manager for the EGG corporate proposal for the management and operation of DOE's Pantex Plant.
- Member of numerous Proposal Red Teams for various clients proposing to the DOE with participation in proposal modification and recovery efforts.

Note: Some of the assignments/accomplishments summaries have been duplicated from one major area to another where there is duplicate applicability.