

SUMMARY OF EXPERIENCE

Bob has a strong track record as a persuasive and eloquent change agent who improves performance and gets results for firms

- Extensive experience in leading scoping studies, performing design of refineries, petrochem. plants, oil & gas, storage facilities
- His greatest depth is process safety, process and utility environmental design, waste treatment, and HSE Management Systems
- Experienced in refinery revamps using “*design-to-capacity*”, “*value improving practices*”, “*stage-gated design*” methodologies
- Initiated corporate standards for third-party contract HSE services in Process Hazard Analysis, Quantitative Risk & Reliability
- Skilled in doing Process Scoping studies, FEED packages, detailed engineering FEL-3 phase of Process and HSE engineering
- Supervisory experience includes plant unit engineers, advanced process optimization specialists, CAD and database developers
- Construction phase roles include logistics, equipment checkout, commissioning of units and systems, and startup shift support
- Taught chemical and materials engineering Process Analysis and Design, plus has been a faculty advisor at several universities
- Implemented operator simulator training for unit startup, mentored control room staff during startup, advised University faculty

KELLOGG, BROWN & ROOT, INC, Houston, TX

Process Technical Advisor (2008 – 2009)

- Revised department Systems Engineering Excel data sheets to enable US or Metric units, plus smart validation of data entry
- Updated Process Development department intranet website to deal with migration of Technologies to a separate department

Gasoline Benzene Reduction Project – ConocoPhillips, Borger TX

- Project revamp scope encompassed distillation heat integration plus hydrogenation of aromatics to reduce benzene percentage
- Assigned mid-way into detailed design, took over getting P&IDs “Issued for Design” through to closure of PHA Action Items
- Ensured Safety Integrity Level (SIL) review decisions were executed for impacted instrumentation, control and valve systems
- Appointed Systems lead of the “Issue for Construction” phase for distillation area, naphtha hydrodesulphurization, tank-farm
- Responsible for Management of Change after IFD, quality assurance of Systems calculations, and project closeout documents
- Facilitated bringing engineering inter-discipline inconsistencies to closure, still ensuring a safe, operable and efficient design

Ras Tanura Integrated Project – \$25 billion Dow/Aramco, Saudi Arabia JV

- Assigned as “*Interface Coordinator*” between licensed process technology units and project supporting infrastructure areas
- Participated in technology reviews for ethylene oxide, ethanolamines, salt solution mining, chlor-alkali, flares/incinerators
- Overlaid process scoping diagrams with all their utility streams, emissions and waste streams, consistently across all units
- Defined all physical interfaces: steel, pipe, cable, roads between unit areas and utilities, infrastructure, power and off-sites
- Developed smart software tools to validate, filter and auto-summarize data entry for interfaces between RTIP and licensors

FLUOR ENTERPRISES, Sugarland, TX

HSE Design Principal (2007 -2008)

- Established global corporate sub-contract standards on daily services for expert staff from 3rd-party HSE services companies
- Developed template scopes to access HAZID, QRA, HSE Impact Assessment, RAM, SIL and HAZOP services upon request
- As a senior lead, advised department manager on staff skill mix needed to assign to project taskforces, recruited new staff

Odoptu First Stage Processing Project – ExxonMobil, Sakhalin, Russia

- Led the HSE team for emergency shutdown, fire and gas detection, fire protection, reliability, process area access and egress
- Used “*Fine Mist*” systems for fire suppression in process modules, water storage in adjacent heated process module buildings
- Achieved approval for alternative insulation (foam-in-place between metal panels) for prefabricated modules shipped to site
- Authored HSE optimization Studies pre-FEED, addressing frozen climate issues e.g. enclosed process modules, fire-fighting
- Authored Philosophies and Management Plans for HSE, advised Site HSE Manager on his corresponding construction Plans
- Used knowledge of international codes to review Russian standards/codes, ensured project Alternative Designs got approval
- Managed third-party subcontracts for HAZOP, Reliability/Availability/Maintainability, blast and noise prediction/mitigation

Habshan Alpha Platform Project - ADMA-OpCo, Umm Schaif Field

- Took over as HSE lead on FEED for a sour gas processing platform needing a major design change from three levels to four
- Evaluated safety aspects of the revised 3D model, developed HSE design path for equipment, structure & personnel protection
- Set up and managed third-party contracts for consequence modeling & HSE impact assessments with firms in the UK & USA
- Managed sizing and specs for deluge & monitors, fireproofing, gas & flame detection, emergency shelters and escape systems
- Ensured full Safety Case documentation met scrutiny of independent European verification firm plus PMC HSE rep. at KBR

SHAW, STONE & WEBSTER, Houston, TX

Sr. Process Systems Engineer (2006 – 2007 contract)

Refinery Major Expansion - Marathon, Garyville LA

- Responsible for validating Fluor's FEED package, managed Q.A of detailed P&IDs in Hydrocracker and Hydrotreater units
- Developed 3D geometry of gravity process water/rain sewers and firewater mains, ensured no conflict with lines or foundations
- Specified systems conditions for "Specialty Engineered Items" data sheets within Hydrocracker and Kerosene Hydrotreater units
- Ensured equipment data was consistent with P&IDs and Data Sheets, for all compressors, exchangers, heaters, pumps & vessels
- Provided HSE expertise in 3D model reviews of equipment plan, personnel access, location of safety sensors and fire protection

Gasoline Desulphurization Project - Giant Industries, Yorktown VA

- Performed design & procurement technical review for systems outside process unit: SO2 scrubber/oxidation and cooling water
- Prepared data sheets and requirements in materials selection, performance, commissioning and warranties for package systems
- Developed process control strategies, storage sizing & transfer requirements for gasoline desulphurization unit feed & products
- Facilitated HAZOP workshops of detailed P&IDs for "S-Zorb" technology for process unit plus supporting offsites and utilities

ANVIL CORPORATION, Bellingham WA

Senior Process Engineer (2005-2006 contract)

Canadian eXtra Heavy Oil Study - BP, Cherry Point WA

- Developed technology selection and equipment sizes for FEL2 "Select" phase on crude oils alternative to Alaskan North Slope
- Analyzed options for sustaining Coker and Calciner throughput, while still meeting constraints on metals in anode-grade coke
- Developed complete specifications and licensing requirements for a new Merchant Hydrogen unit to be collocated on-site at BP
- Fully implemented remote access to BP's online process and laboratory data, used to establish current baseline for case studies

COMPUTER SCIENCES CORP/DYNCORP, Washington DC

Technical Consultant (1988-2005)

- Provided expertise as a Professional Engineer, experienced doing complex systems, to EPA, OSHA and other federal agencies
- Worked initially as an internal consultant, advising Dyncorp's Task Order managers on their design options for compliance

EPA Emergency Operations Center Upgrade (2004)

- Managed technology upgrade of EOC videoconferencing, data communication mapping visualization & decision support tools
- Met mandated schedule for upgrade/remodel installation during a two-week shut-down window between Presidential primaries
- Expanded capability to view real-time video, satellite surveillance, automated aerial imagery updates, interagency info. sharing
- Tested and proved EOC capability to do ten-way video-conferencing, supported by electronic white-boarding in breakout rooms

EPA Oil Program Support (2002-2005)

- Developed mapping database intranet system for all fuel storage tankfarms in U.S. for use in spill containment, DHS response
- Principal reviewer of the responsibilities of a P.E. in EPA's update of Spill, Prevention, Control and Countermeasure program

DOJ Redistricting Software (2000-2001)

- System Architect for geospatial analysis tools for Voting Rights redistricting analysis using Census 2000 race data percentages
- Presented key features of capability to minimize gerrymandering with docked windows presenting map, race data and graphs

Superfund Program Support (1998-2000)

- Managed Lotus Notes, Web and Oracle application development staff for Superfund, Brownfields and Oil Spill assignments
- Provided Subject Matter guidance to CSC Work Assignment Managers for EPA contracts; developed OSHA Expert Systems

MOBIL CORPORATION (1990-1998)

Mobil Global Professional Services, Fairfax VA (1995-1998)

Environment, Health & Safety

- Defined EHS Management System framework across E&P, Transportation, Refining, Petrochemical, Chemical, Oil and Gas
- Project Manager of GENIE "Global EHS Network Information Enabler" best practices network with global specialist teams
- Supervised nine-person team of developers, two paralegals for daily content update and deployed GENIE on four continents
- Chosen as a global best for ROI savings by Benchmarking Partners, and presented at international LotusSphere conference
- Prototyped expansion to "BestNet" for Mobil's Best Practices for over 100 subject matter areas e.g. corrosion, turnarounds
- Trained "Korea Gas" engineers to fully understand API, ASME, ASTM, NFPA standards for safer design of LNG facilities

Mobil R&D Corp, Princeton NJ (1990-1995)

Environmental Research & Engineering (1993-1995)

- Co-managed \$20 million/year R&D budget for process measures to reduce pollution; co-wrote Refinery Water Reuse manual
- Led Mobil's role at quarterly P.E.R.F. meetings in collaborating with oil and power companies on shared cost R&D for HSE
- Active in field trials to reduce desalter emulsions, quantify refinery unit emissions, and improve fugitives monitoring systems
- Served on API committees for Refinery MACT regulations and wrote MACT compliance training manual together with EPA

Refining "Process Advisory" Systems (1990-1992)

- Led team of process engineers developing optimization correlations for Mobil-licensed technologies, using global refinery data
- Process architect implementing PROMIS "Process Management Information Systems" for three of Mobil's European refineries

New Zealand Synthetic Fuels Corp, Motonui NZ (1985-1990)

- Initially did acceptance startup tests of all non-process units from Bechtel, working with senior Mobil R&D Corp Facilities

Methanol Plant Debottlenecking

- Applied case studies of large ASPEN model of natural gas reforming & methanol synthesis to identify bottle-necks
- Prioritized bringing in second, high-CO₂ content pipeline to increase production 9% with stoichiometric mixed feed gas
- Developed pipeline transient monitoring system for Fox 1/A system as advance warning for feed & fuel control systems
- Presented *Prevention of Reformer Overfiring During Startup* to AIChE Loss Prevention Symposium, San Diego, 1990

Process MIS & LIMS

- Setup graphic monitoring of process conditions by setting up color schematics with updating values from "Fox 1/A"
- Developed technical applications on "IBM 4361" mainframe with GDDM graphics and SQL/DS relational database
- Worked with process engineers to identify and develop the schematics, daily reports and trend analysis for each unit
- Integrated lab data by direct connection to HP analyzers, and setting up lab tags for all routine wet chemistry results

CADD

- Installed the first large twin-screen Intergraph system in N.Z., used it to manage 18,000+ drawings from Bechtel
- Accredited N.Z. Synfuel Library for Interloan between technical libraries, maintained Tech. Standards repository

University of Auckland, Auckland NZ (1983-1985)

Senior Lecturer, Dept. of Chem. & Materials Eng.

Process Analysis and Synthesis

- Developed and delivered materials from 10-years design, consulting and startup experience in Gulf Coast of the US
- Developed a categorized list of 1,000 published references in process design and taught students how to access them
- Developed software in FORTRAN and BASIC for execution on six dedicated workstations in purpose-created room

Process Design Project

- Rather than all students doing the same project, each team was given their own industry sector process plant to design
- Examples of plants chosen were relevant to NZ's resources: e.g. aluminum from alumina, phosphate fertilizer, dairy milk processing, oil and gas processing, steel by electric furnace from ironsands, glass-making, brewing, cement manufacture
- Over the academic year, the teams each had to produce Process Flow Diagrams, Heat and Material Balance, size major equipment, propose control schema, do screening-level Hazard Analysis, present their project to the C&M Dept. Faculty
- Had each team of four choose their own lead person to coordinate the division of tasks. I met weekly with just the 12 leads, in order to make them accountable for gathering questions, but accompanying lectures and tests I gave were for the whole class.

Forster-Morrell Engineering, Colorado Springs, CO (1982-1983)

Senior Process Engineer

Energy Conservation for DOE Rocky Flats

- Gathered data about facility building HVAC designs, data on process unit energy consumption, steam, power, CW
- Developed BASIC program analysis tools on PDP-8, using ASHRAE handbook as approved calculation methods
- Prepared reports showing potential energy savings, in MMBTU, KW, gallons plus \$/year, retrofit cost estimates

Alternatives for Electronic Industries Wastes

- Developed an options paper for State of Colorado, presented it to the Colorado House State Affairs committee
- Incineration system for electroplating solvent waste streams and vitrification system for heavy metals residues
- Opportunity for regional waste processing firm

PetroMAS Engineering Services, Friendswood, TX (1974-1981)

Process Engineer & I.T. Supervisor

Three Refinery Revamp Projects

- Performed simulations, process equipment and line specs, P&IDs, Heat & Material Balances
- During each startup did control loop commissioning and control room panel operator training

Jet Fuel for Gladieux Refinery (1974-1975)

- Crude column and Mercox treater upgrade to meet military JP-4 specifications for Indiana Air National Guard.

Expansion of Gladieux Refinery (1976-1977)

- Design/startup of modifications under "Old Oil/New Oil" pricing to handle broad crude range from 26° to 38° API
- Used split overhead fin-fan condensers plus steam coils to cover wide range of overhead vapor traffic requirements.
- Process assessment of impact on crude column, overhead systems, pumparounds, with switch from sweet light crude

Expansion of Ergon Refinery (1978-1980)

- Process design and startup of major expansion to 25,000 BPSD of Ergon Refining's Vicksburg, Mississippi refinery
- R&D on stable "coal-oil mixture" technology to pipeline coal suspended in residual oil to Mississippi Power & Light.

Merichem Cresylics Springing

- Did process study on switching weak Lewis acid gas used to "spring" cresylics from H₂S to CO₂: driven by safety
- Gathered plant data onsite for development of alternate PFD and material balance, with switch from HS₂S to CO₂
- Automated stoichiometric material balance flow-sheet case study calculations in BASIC to include recycle streams.

Aspartame Precursors

- This pilot plant project was conducted in absolute secrecy: only our boss knew the actual names of client, or ingredients, or the intermediate products! Because of global competition, PPG split production-scale pilot stages across several firms/sites
- We did process design using Component "A", "B" etc with all of the reaction, physical, and transport properties provided.

Environmental Audits

- Under contract to the State of Texas Air Control Board, did analyses of point emissions from aluminum pot-lines, kraft paper mills, fertilizer plants. Compared fence-line calculated emissions to field data, developed mass balances on point sources.
- Performed annual environmental audits for our four ILTA clients, advising them of best practice opportunities to improve.

Wastewater Treatment

- Petrochemical storage tank wastewaters vary significantly in their composition as different product tanks are washed out. Developed biological treatment systems characterized by long retention for slow-degradation kinetics, choice of activated sludge or trickle filter, and planting bull-rushes in serpentine channel ditches for polishing residual heavy metals.

Emissions Inventories

- In BASIC (pre-PC days) developed point-source emission calculation software based on EPA "TANKS" and "AP-42", including summary tabulating emissions for all tanks. Capability to quickly change identity of products, and re-compute entire emissions

EDUCATION AND TRAINING

- B.E. (Honors) in Chemical and Materials Engineering, University of Auckland, N.Z.
- Two years towards Ph.D. on "*Expert Systems in Steelmaking*" University of Auckland

PROFESSIONAL LICENSES/CERTIFICATES

- Registered Professional Engineer, Texas (1983)
- Member, Institute of Professional Engineers, NZ

FACULTY ADJUNCT

- Advisor to Rice University's Chemical Engineering department for re-accreditation of Process Design course
- Co-developed a complete two-year curriculum for new *Professional MS* at American University, 2002 - 2004
- Trained in ArcGIS, taught "*Introduction to Planning*" & "*Advanced GIS*" at Western Washington U. in 2006

ASSOCIATIONS

- Being sponsored into American Society of Safety Engineers - MEC
- Member of NFPA, the National Fire Protection Association, 2007
- Invited member of "*Society of Industrial Leaders*" refining sector
- Member of AIChE from 1977-1983, then 1990 upon return to US
- IChemE member from 1983-1990 while working in New Zealand

PUBLICATIONS

- "*Implementing ArcGIS 8.1 for Redistricting*" ESRI International User Conference, July 2001
- "*Mobil Refines its EHS Regulatory Practices with Notes*"
"Streamline" News for Manufacturing, Summer 1998, Wellesley Information Services
- "*Knowledge Management Across the Global Manufacturing Network using Lotus Notes and Domino*"
Benchmarking Partners for Lotus "Collaborative Solutions for Manufacturing"
- API Publication 335, "*Refinery MACT Workshop*" for the American Petroleum Institute with USEPA Office of Air Quality Planning and Standards. 23-24 October 1995, Orlando, Florida
- "*Emission Inventory Applications of Refinery Stream Speciation Data*", October 1995 for AWMA Specialty Conference, Raleigh, NC and in Hydrocarbon Processing August 1997
- "*Toxic Combustion Byproducts*", PERF Project 92-19 (Bob Andrew & Jim Seebold)
- API Publication 4630, "*Electronic Exchange of Environmental Compliance Information: A Proposed Approach*", August 1995. (Bob Andrew - Mobil & John Grisinger - Radian)

- *"Reducing the Desalter Environmental Impact"* PERF Project # 91-14, (Members Only) January 1993, Petroleum Environmental Research Forum
- *"Prevention of Reformer Overfiring During Startup"* C. J. T. Bush, H. J. Weake and R. D. Andrew, AIChE Loss Prevention Symposium, San Diego, 1990
- *"The Role of Humanities in Engineering - A Personal View"* R. D. Andrew Proceedings of the Auckland University Engineering Society, 1971
- *"Kinetic Model of Steel Refining for a Batch Process"* R. D. Andrew and G. A. Wright, Proceedings of the Auckland University Engineering Society, 1970