

## William J. Rapp – Description of Recent Projects

PROJECT	OBJECTIVE	ACTIONS	RESULTS
<p><b>Onshore and Offshore Nigeria - Associated Gas Gathering Projects</b></p> <p>Client : Super-Major Integrated Oil and Gas Company</p> <p>Time Frame: Oct. 2005- March 2008</p>	<ul style="list-style-type: none"> <li>• Evaluate alternatives for the offshore and onshore oil fields to comply with the Nigerian Government’s directive to stop routine flaring of gas after 2008.</li> <li>• Recommend preferred investment alternatives for the fields to economically gather and dispose of the associated gas in order to comply with the Government directive.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructed probabilistic decision and risk analysis economic model to evaluate the gas gathering alternatives</li> <li>• Incorporated reserve and productivity information, and development costs of the different alternatives to evaluate relative economics and risks.</li> <li>• Evaluated the sensitivity of the various alternatives to a potential change in tax/fiscal regime.</li> <li>• Presentations of findings to company management and preparation of reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Probabilistic Decision and Risk Analysis model was constructed and set-up to analyze the alternatives.</li> <li>• A number of different alternatives were recommended for further development</li> <li>• Recommended options depended on the field and consisted of three-phase gathering, separation and compression, multi-phase pumping and liquids recovery. Disposal options consisted of gas sales and underground reinjection.</li> </ul>
<p><b>Evaluation of Re-Development Options of Vandalized Onshore Oil Fields In Nigeria</b></p> <p>Client : Super-Major Integrated Oil and Gas Company</p> <p>Time Frame : Oct. 2003- March 2008</p>	<ul style="list-style-type: none"> <li>• Evaluate economic potential of re-developing existing proved reserves in onshore fields after the field facilities and pipelines had been damaged through vandalism.</li> <li>• Evaluate options for redevelopment of these fields including various facility options, secondary recovery and artificial lift options.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructed probabilistic decision and risk analysis economic model to evaluate the re-development options.</li> <li>• Incorporated reserve and productivity information, and development costs, of the different options to evaluate the relative economics and risks of the alternatives.</li> <li>• Presentations of findings to company management and preparation of reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Decision and Risk Analysis model was constructed and reviewed by client representatives.</li> <li>• As a result of this evaluation, two early-production systems (EPS) were recommended and approved by the client’s management for development.</li> <li>• In addition to the early production system, a rebuilding of one of the damaged flow stations was recommended in the study and implemented by the Client.</li> </ul>

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<p><b>Independent Power Plant Project</b></p> <p>Client : Super-Major Integrated Oil and Gas Company</p> <p>Time Frame: April – Dec. 2006</p>	<ul style="list-style-type: none"> <li>• Study the economic feasibility and analyze the risks of building a natural gas-fired independent power plant project in Nigeria</li> <li>• Evaluate alternatives of simple cycle vs. a combined cycle plant</li> <li>• Evaluate options of phased vs. non-phased construction</li> </ul>	<ul style="list-style-type: none"> <li>• Advise project team on Decision and Risk Analysis processes and procedures for studying the feasibility of building a combined cycle power plant in Nigeria</li> <li>• Assist in project framing and development of decision hierarchy, influence diagram, and definition of uncertainties</li> <li>• Assist project team economist in the development of the probabilistic economic model and the analysis of alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• A project frame, decision hierarchy and influence diagram were validated with the project team</li> <li>• Based on the results of the analysis, construction of a combined cycle power plant was recommended for further development</li> <li>• The analysis showed that phasing of plant construction is not favored economically</li> <li>• Client agreed to further development of the non-phased, combined cycle power plant option.</li> </ul>
<p><b>Topping Plant Feasibility Study</b></p> <p>Client: Super-Major Integrated Oil and Gas Company</p> <p>Time Frame: July 2005 – Nov. 2006</p>	<ul style="list-style-type: none"> <li>• Evaluate the feasibility of construction of topping plant in Nigeria.</li> <li>• A wide range of plant capacities were considered.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructed probabilistic decision and risk analysis economic model to evaluate the plant capacity and facility option alternatives.</li> <li>• Studied market demand and expected pricing in the Nigerian market for diesel and kerosene products to be produced by the plant.</li> <li>• Evaluated various plant sizes that ranged from a small plant to satisfy fuel needs for operations only, to larger plant sizes designed to serve local markets</li> </ul>	<ul style="list-style-type: none"> <li>• Study results indicated that building a small plant size designed to only produce petroleum products for the client’s operations in Nigeria is not economical</li> <li>• Recommended plant capacity for producing petroleum products for the Nigerian marketplace, in addition to supplying operating needs.</li> <li>• Defined a range of pricing points for negotiations, along with commercial terms, that the client would have to receive for the products in order to receive an adequate economic return on the topping plant investment.</li> </ul>

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<p><b>Offshore Gas Production and Transportation Debottlenecking Study</b></p> <p>Client: Super-Major Integrated Oil and Gas Company</p> <p>Time Frame: Oct. 2004 -Jan. 2006</p>	<ul style="list-style-type: none"> <li>• Analyze the effects of existing gas supply delivery bottlenecks and their effect on future gas sales commitments.</li> <li>• Evaluate alternatives for removing the bottlenecks.</li> <li>• Recommend preferred debottlenecking alternative.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructed probabilistic decision and risk analysis economic model to evaluate alternatives</li> <li>• Incorporated well productivity information, capacity limitations and alternative costs to evaluate alternative economics and risks.</li> <li>• Analyzed risks associated with the alternatives to meet gas contract delivery requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Study results indicated that debottlenecking of offshore gas dehydration facilities provided the most economical solution to ensure a reliable supply to meet gas contract requirements.</li> <li>• Client implemented the study results</li> </ul>
<p><b>Nigerian LNG Project Feasibility Studies and Evaluations</b></p> <p>Client : Super-Major Integrated Oil and Gas Company</p> <p>Time Frame : Oct. 2003- June 2005</p>	<ul style="list-style-type: none"> <li>• Evaluate the economic advantage and associated risks of various facility investments being contemplated for gas supply to a major LNG liquefaction plant being planned.</li> <li>• Selection of fields to be developed, and development sequence.</li> <li>• Recommend the most economic, and reliable, alternatives to meet potential future gas supply commitments.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructed probabilistic decision and risk analysis economic model to evaluate the gas supply alternatives to the LNG plant. This model was linked with an LNG plant model, developed by another analyst, in order to evaluate the combined Upstream/ LNG plant perspective.</li> <li>• Incorporated reserve and productivity information, and development costs, of a number of offshore gas fields into the model to evaluate the relative economics and risks of various development scenarios</li> <li>• Presentations of findings to company management and preparation of reports</li> </ul>	<ul style="list-style-type: none"> <li>• Decision and Risk Analysis model was constructed and reviewed by client representatives.</li> <li>• A selection of an optimal field development sequence and gas processing options was proposed, and accepted by the client, for further development in the LNG supply project's front-end engineering and design (FEED) effort</li> </ul>

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<p><b>Decision and Risk Analysis of Oil Export Terminal Capacity Expansion Options</b></p> <p>Client : Major Integrated Oil and Gas Company</p> <p>Time Frame : Oct. 2002 – Jan. 2003</p>	<ul style="list-style-type: none"> <li>• Evaluate the economic advantage and associated risks of various facility investments being contemplated at a major oil export terminal in West Africa. Recommend most economic alternative to meet future production and export goals.</li> </ul>	<ul style="list-style-type: none"> <li>• Gathered statistical data on terminal and marine operating performance at the marine terminal in West Africa.</li> <li>• Scoped the various investment options with company personnel. These included additional storage, pipeline expansions and additions, marine berthing modifications and tanker scheduling.</li> <li>• Constructed probabilistic decision and risk analysis economic model to evaluate the alternatives.</li> <li>• Presentations of findings to company management and preparation of reports.</li> </ul>	<ul style="list-style-type: none"> <li>• Decision and Risk Analysis model was constructed and reviewed by company personnel. Trained local staff in the use of the model for future studies.</li> <li>• An investment option of additional storage, use of drag reducing inhibitors and surge control, costing approximately \$ 50 million was recommended and approved by company management. This saved approximately \$ 80 million over other investment options which had been contemplated.</li> </ul>
<p><b>Evaluation and Marketing of South Texas Onshore Producing Gas Properties</b></p> <p>Client : Independent E&amp;P Company</p> <p>Time Frame : Aug - Oct. 2002</p>	<ul style="list-style-type: none"> <li>• Evaluate existing proved reserve base and upside potential of sale package consisting of interests in 175 wells. Market properties through telephone solicitations and data room presentations.</li> </ul>	<ul style="list-style-type: none"> <li>• Project Manager for multi-disciplinary team evaluating reserves and economics.</li> <li>• Performed commercial analyses on gas marketing, product quality, and capital and operating cost inputs to the economic evaluation.</li> <li>• Prepared and organized presentation of sale package reports and exhibits.</li> <li>• Prepared and delivered presentations to 24 prospective buyers' in the data room.</li> </ul>	<ul style="list-style-type: none"> <li>• Reserve and economic evaluations for the properties were completed and data packages prepared and presented. Favorable feedback was received from potential buyers on the completeness of the data packages.</li> <li>• The client closed the sale on the properties in November 2002 for a sales price of \$ 33 million.</li> </ul>

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<p><b>West Africa Deepwater Offshore Bid Rounds</b></p> <p>Customer : Texaco Exploration</p> <p>Time Frame : 2000-2002</p>	<ul style="list-style-type: none"> <li>• Assess exploration potential, prioritize areas for bidding, and develop bidding strategy and bids</li> </ul>	<ul style="list-style-type: none"> <li>• Analyzed well data, and developed statistical data correlations between reservoir properties and stratigraphy from well and seismic data.</li> <li>• Performed probabilistic resource potential analyses for prospects and plays in the areas of interest</li> <li>• Integrated geological , geophysical and engineering inputs into economic model</li> <li>• Developed decision analysis model to evaluate bids</li> </ul>	<ul style="list-style-type: none"> <li>• Developed economic screening model for exploration blocks based on reserve potential, geologic risk, and investment in 5,000 – 10,000 ft. water depths.</li> <li>• Prioritized blocks for acquisition in the Year 2000 bid round.</li> <li>• Bid was submitted on the most attractive block. Legal complications have surrounded the award of this block.</li> <li>• Three additional blocks were prioritized for bidding in bid rounds expected in 2002 -3.</li> </ul>
<p><b>West Africa Deepwater Joint Venture Conflict Resolution</b></p> <p>Customer: Texaco Commercial Development and Texaco Exploration</p> <p>Time Frame : 2000-2001</p>	<ul style="list-style-type: none"> <li>• Resolve a conflict of interest dispute between joint venture partners which had arisen as a result of production sharing ringfencing terms</li> <li>• Resolution of the problem was necessary to align the disputing partners and to allow investment to proceed</li> </ul>	<ul style="list-style-type: none"> <li>• Developed economic model that demonstrated the effects of the ringfencing of terms to the parties in dispute for various exploration and development scenarios.</li> <li>• Developed and presented problem solution options to the disputing parties, utilizing the economic model as a tool.</li> </ul>	<ul style="list-style-type: none"> <li>• As a result of lengthy negotiations, a method to resolve the dispute, while still maintaining the benefits of the ringfencing, was approved by both parties.</li> </ul>
<p><b>Australasia Deepwater Basin Bid Round</b></p> <p>Customer: Texaco Exploration</p> <p>Time Frame: 1999-2000</p>	<ul style="list-style-type: none"> <li>• Assess exploration potential, highgrade areas for bidding, and develop bidding strategy and bids for blocks offered in the basin by an Australasian country's government.</li> <li>• Coordinate evaluation with partner company who was actively evaluating the area</li> </ul>	<ul style="list-style-type: none"> <li>• Performed probabilistic resource potential analyses for plays and prospects.</li> <li>• Developed a decision analysis model that valued a seismic option bid for the blocks</li> <li>• Liaised with the partners' evaluation representatives to drive agreement on the method and results of the economic evaluations of block bids.</li> </ul>	<ul style="list-style-type: none"> <li>• Bids for three blocks were submitted by the partnership. These carried both seismic options and drilling commitments.</li> <li>• All three bids were successful and the blocks were awarded to the partnership.</li> </ul>

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<p><b>Probabilistic Economics Program Development and Training</b></p> <p>Customer : Texaco Upstream and Corporate</p> <p>Time Frame: 2000</p>	<ul style="list-style-type: none"> <li>• Develop a new program and procedures across Texaco Upstream for probabilistic evaluation of investment opportunities.</li> <li>• Develop and deliver an introductory training session on this new program</li> </ul>	<ul style="list-style-type: none"> <li>• Developed guidelines, tools and procedures for conducting probabilistic economics of Upstream investments.</li> <li>• Developed two-day training session to initiate the program</li> <li>• Delivered a half-day portion of the training at six locations.</li> <li>• Provided follow-up advice and assistance in implementing the program</li> </ul>	<ul style="list-style-type: none"> <li>• The new program was generally well received by the professionals who were being asked to implement it.</li> <li>• Introduction of the program raised corporate competence to evaluate risk and uncertainty in the Upstream.</li> <li>• The program generated an additional initiative to increase competency in the area of decision analysis.</li> </ul>
<p><b>West Africa and Caribbean Asset Rationalization Studies</b></p> <p>Customer: Texaco Upstream and Corporate</p> <p>Time Frame : 1999 –2000</p>	<ul style="list-style-type: none"> <li>• Explore various asset trade, acquisition, and divestment alternatives in West African and Caribbean countries.</li> </ul>	<ul style="list-style-type: none"> <li>• Led team investigating various asset acquisition opportunities in a Caribbean country.</li> <li>• Constructed asset and portfolio economic models to analyze various asset mix opportunities.</li> <li>• Integrated commercial and technical inputs into economic models</li> <li>• Developed various asset acquisition and divestment recommendations</li> </ul>	<ul style="list-style-type: none"> <li>• While the results of the study did not cause any acquisition or divestment to take place, the evaluation of one major asset demonstrated significant upside potential that had previously not been considered, As a result, it was decided not to sell this asset which had previously been slated for divestment.</li> </ul>
<p><b>Corporate Acquisitions Program</b></p> <p>Customer: Texaco Corporate Development</p> <p>Time Frame: 1997-1999</p>	<ul style="list-style-type: none"> <li>• Investigate and evaluate a number of corporate acquisition candidates utilizing both publicly available data and data obtained by internal and external intelligence sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Analyzed in detail all or parts of 10 companies for acquisition potential with values from \$ 500 million to \$ 15 billion.</li> <li>• Conducted detailed “bottoms-up” evaluations of companies based on their asset values.</li> <li>• Conducted economic evaluations of companies’ reserves based on their SECproved reserves values.</li> </ul>	<ul style="list-style-type: none"> <li>• While the results of the evaluations resulted in several, sometimes-lengthy negotiations with potential acquisitions candidates, an acquisition was not made.</li> </ul>

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<p><b>Development of Business Plan for the Caspian Region and Acquisitions of Assets</b></p> <p>Customer : Texaco Middle East/Far East and Texaco Exploration</p> <p>Time Frame : 1996 – 1998</p>	<ul style="list-style-type: none"> <li>• Develop a business plan for the Caspian Region to grow Texaco’s business in the region. Countries investigated were Kazakstan, Azerbaijan, and Turkmenistan</li> <li>• Evaluate major asset acquisitions opportunities in the region in alignment with the business plan</li> </ul>	<ul style="list-style-type: none"> <li>• Performed high-level scoping evaluations of a number of asset acquisitions opportunities for the business plan formation.</li> <li>• Developed detailed acquisition economic models and performed detailed evaluations of three acquisition opportunities.</li> <li>• Evaluated an exploration farm-in to a very high potential block in the Caspian Sea.</li> </ul>	<ul style="list-style-type: none"> <li>• Of the three asset acquisition opportunities that were pursued, two were acquired.</li> <li>• A competitive bid was submitted for the third asset acquisition opportunity; however our offer was bested by another bidder</li> <li>• The exploration farm-in opportunity was not pursued as decided by company management</li> </ul>
<p><b>Development of a Southeast Asia Business Plan and Acquisitions of Assets</b></p> <p>Customer : Texaco Middle East/Far East and Texaco Exploration</p> <p>Time Frame : 1995 – 1997</p>	<ul style="list-style-type: none"> <li>• Develop a business plan to grow Texaco’s business in Southeast Asia. Countries investigated were Thailand, Vietnam, Myanmar, Cambodia and Bangladesh,</li> <li>• Evaluate major investment and asset acquisition opportunities in the region in alignment with the business plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Developed a business plan for maximizing the use of existing assets in Southeast Asia.</li> <li>• Constructed economic models and integrated technical and commercial data to evaluate various new asset acquisitions opportunities including farm-ins to exploration properties, producing asset acquisitions and exploration bid round offerings.</li> </ul>	<ul style="list-style-type: none"> <li>• Based on the business plan, a more aggressive work program for gas exploration, instead of the previous oil focus, was decided. This resulted in two gas discoveries.</li> <li>• A farm-in to highly prospective exploration acreage in Thailand was completed.</li> <li>• Two successful bids were made on high potential exploration blocks in Vietnam and Bangladesh.</li> </ul>
<p><b>New Country Entry Study – South Asia</b></p> <p>Customer : Texaco Middle East/Far East and Texaco Exploration</p> <p>Time Frame : 1995</p>	<ul style="list-style-type: none"> <li>• Developed a business plan for entering a South Asian country, where Texaco did not have any existing Upstream assets at the time.</li> </ul>	<ul style="list-style-type: none"> <li>• Visited the country to gather information and data about privatization offering of fields.</li> <li>• Gathered and reviewed data on asset acquisition opportunities from other private companies.</li> <li>• Constructed economic models and integrated technical and commercial data to evaluate the privatization and asset acquisition opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>• A business plan to enter the country with a combination of a producing asset acquisition and an exploration farm-in was prepared. However, company management did not accept the plan, as competing investment opportunities were preferred.</li> </ul>