



Figure 1: DRC Suitability MatrixSM (left) and Portfolio Monitoring (right)

Real-Time Reservoir Tracking and Monitoring for 4-D Computer-Aided Lean Management (CALM)

In order to better manage the production of oil and gas from individual wells and fields into and through a vast pipeline and transportation system and into refining and petrochemical plants, DRC and a sister company vPatch (the virtual oil patch) built a decision support system that balances subsurface reservoir realities with business constraints and contractual requirements to optimally manage a vast portfolio.

The business focus of TMI-12 is to implement wired processes connecting business decision-making to the “last-mile” of the hydrocarbon reservoirs themselves. The digital convergence making a two-way distributed “nervous system” possible is the network itself becoming the computer. An aging workforce, in which 60% of the current management will be gone by 2020 makes the distributed nervous system compelling.

The work at vPatch resulted from: a grant from Landmark Graphics’s University Program to LDEO (Lamont Doherty Earth Observatory of Columbia University); the formation of the GBRN (Global Basin Research Network) at Cornell, LDEO, Woods Hole, and LSU to study the dynamic replenishment of oil and gas fields in historical time-frames; formation of CES (Columbia Exploration Systems); the LDEO 4-D Consortium, studying time-lapse seismic; the LDEO Portfolio Analysis Consortium, helping oil companies optimize the oil and gas fields they retain; and the publication of CALM (Computer Aided Lean Management) by Dr. Roger N. Anderson. The bottom line are a set of information and knowledge management technologies which allow real-time tracking of oil, gas, and water in order to insure reservoirs are being optimally drained. Information is managed by the Suitability MatrixSM (see the left side of Figure 1) and the tools allow for real-time portfolio monitoring and management (see the right side of Figure 1).

DRC proposes a \$5 million investment and a field approaching rapid decline where these technologies can be applied to optimize the remaining production from the field. Dr. Roger Anderson and Albert Boulanger are the technical team leaders for TMI-12, and they have a team of about 20, many of whom we have worked with since the late 1980’s who will support implementation.