Chevron's Knowledge Networks and Operational Excellence

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Knowledge Networks and Operational Excellence

Global enterprise excellence and shared learning combine to support one of ChevronTexaco's critical business strategies – Operational Excellence (OE). For us, OE means building world-class performance in safety, health, environment, reliability and efficiency. Our objectives are to:

- Achieve an injury-free workplace
- Eliminate spills and environmental incidents. Identify and mitigate key environmental risks
- Promote a healthy workplace and mitigate significant health risks
- Operate incident free with industry-leading asset reliability
- Maximize the efficient use of resources and assets

Safety is a shared value at ChevronTexaco. We want people to go home safely every day. To deliver and sustain high levels of performance, we must engage employees throughout the organization to develop a culture where everyone believes that all accidents are preventable and that "zero incidents" is possible.

To improve upon our high reliability, we must avoid unplanned events, continue to reduce disruptions from external events, and even more effectively schedule and optimize planned downtime. This requires an understanding of critical systems, processes and the people involved in them to identify recurring problems, their root causes, and corrective measures. With similar operations in place around the globe – quickly sharing and leveraging information can have a very positive impact on our business.

For effective global knowledge-sharing, we are designing processes, recognizing and rewarding behaviors and using enabling technology to deliver successful practices, lessons learned and answers to questions where and when they are needed. Before describing the structure of our networks, let's take a look at some typical examples that illustrate the value of shared learning.

Value of Knowledge Sharing

Cost and time savings were captured during the solution of a recent weather-induced problem in one of our processing units. A lightning strike caused problems with instrumentation that led to a higher feed input and resulted in sooting of the catalyst bed. The unit's engineer looked for suggestions to remove the soot and reduce the resulting pressure drop by posting a question in GRKM (the global refining KM website). By the time he got to work the next day, he had received four replies from an operations superintendent, a process engineer, a process advisor and a process technical expert in four different locations. Based on their feedback, he had a workable plan to correct the problem and reuse the catalyst. This saved over $100,000 and at least a day of his time trying to research the problem.

Network-enabled rapid communication provides an example of the potential value of sharing lessons learned. One of our business units (BU) received an incident report from a partner operating an oil field. While completing a well, a service contractor was preparing a perforating gun, which is used to shoot holes in the well casing to allow for gas production. An electrical problem caused the gun to fire prematurely, resulting in significant damage to the well. Immediately, three people in the BU entered the report into both the Drilling and Completions and the Formation Evaluation email networks. Several hundred operating and technical staff received the report, including two well logging specialists. Aware that the same type of job was planned at another location, they contacted an employee at that unit who stopped the perforating operation and did not reschedule the work until his team could address all issues. It took just four days between the incident and the report being used half a world away and potentially saved $30 million.

The proactive sharing of successful practices also provides potential value. A catalytic process unit was experiencing fouling of a wet gas compressor. The process team tried an on-line water washing procedure that hadn't been used before. The procedure successfully removed the fouling and avoided a costly shutdown. When submitting their practice to the network, the team estimated the potential savings for reuse at $500,000 and over 80 hours of labor. The unit's engineer commented, "I especially like the

global aspect of GRKM - I'm very used to sharing info with the US refineries but this really has opened the door to contacts around the world."

An example of sharing between diverse business operations took place when the project team for a new offshore oil platform being constructed for a field in West Africa needed world-class operating and maintenance practices for their control room. Team members attended a worldwide operations networking forum where they learned about similar processes in a refinery. This led to significant costs savings when the project team then visited the refinery and was able to identify several cost saving and efficiency improving practices that they could adopt. Examples of "transferable" practices included control system graphics, a control room operator screening tool, the refinery's reliability-centered maintenance concepts to identify platform operating and maintenance processes. The project team is also seeking ways to use refinery staff to help with training for future platform control room operators, craft team leaders and operations planners.

Safety networks provide a facilitated Quality Fitness Review (QFR) to help business units develop action plans for improving their OE performance. During this two day session, network core team members help business unit leadership and other personnel responsible for managing the relevant focus area to identify improvement opportunities, develop prioritized action plans to close performance gaps, and increase alignment around the improvement efforts. A reliability improvement network sponsors pilots that help business units apply the Reliability Opportunity Identification (ROI) process to recognize prospects for reliability improvement. Initial pilots have identified multi-million dollar cost-saving opportunities.

Other examples of global collaboration and problem-solving include:

- Liquid sulfur had accumulated in the pilot gun of a reaction furnace. The crew had not seen this happen before and asked for help on a root cause analysis as well as suggestions for preventive actions. Within a few days they received information from four different refineries that helped them modify their operating procedure.
- One refinery had a plant shutdown during a power disruption. The process engineer received a number of good ideas for future implementation from global peers and avoided the cost of a study by an engineering firm.
- A refinery engineer needed to isolate a unit by freezing a water cooling line but had never done this before. Answers provided from the reliability-focused maintenance network gave her the information to tackle the procedure with confidence. The collection of freezing procedures was also documented for future application by the network leader.
- A refinery engineer requested tips for safely cleaning a packed column in a unit scheduled for turnaround. Members of the reliability network shared information on fire and safety issues and updated guidelines for safe repair and cleanup of packed bed columns.

Role and Structure of Networks

As illustrated in these examples, networks are a critical component for connecting our people, processes and culture to achieve OE objectives. ChevronTexaco sponsors a number of global networks in areas such as health and safety, exploration and production, refining and information technology. These networks have proliferated significantly since our recent merger as we explore ways to integrate our varied cultures, businesses and work processes into a new seamless organization of 53,000 employees operating in 180 countries.

Networks come in many different shapes and sizes. Informal networks that involve people with a common interest (typically called communities of practice) are very popular but vary significantly in structure and/or responsibility. Groups that focus on critical competencies and core processes use a more formal or "strategic" network structure. These networks have formal charters and annual operating plans, BU sponsors, selected leaders and core team members with performance agreements, network funding, clear deliverables and metrics. Regular teleconferences, workshops and moderated collaborative websites are also part of the network operations. We have assembled an online toolkit that guides a group in the design, launch and sustain phases of the network life cycle. The toolkit contains example documents and processes contributed by existing networks. We also provide facilitators that work with

new networks to accelerate the design and launch phases. There are over 40 of these networks either launched or in design. In this article, we will describe these "strategic" networks in more detail.

Inside an OE Network
As part of ChevronTexaco's focus on safety, we have created five strategic networks:

- **Motor Vehicle Safety (MVS):** vehicle crashes are the No. 1 cause of work-related fatalities.
- **Contractor Safety Management (CSM):** contractors account for roughly two-thirds of the hours worked on our behalf and more than 80 percent of work-related fatalities.
- **Repetitive Stress Injury Prevention (RSIP):** computer-related repetitive stress injuries account for more than 20 percent of employee work-related incidents.
- **Reliability Improvement (RI):** design, operation and maintenance of our facilities to sustain mechanical integrity, provide personal safety and prevent incidents are fundamental to our business success.
- **OE Champions:** provide the core of technical expertise in OE, facilitate deployment of the OE management system and support BU leadership in achieving OE performance.

These networks started as traditional project teams chartered to develop guidelines to establish a consistent expectation and approach for addressing risks and opportunities common to all ChevronTexaco organizations. As the project turns to deployment in the business units, the project team is often no longer actively engaged. Our Health, Environment and Safety (HES) Steering Council realized that there was a continuing need to have a group to speed implementation and continually improve the recommendations and tools of the project team. We transformed the project teams into networks, expanded them with members from many business units and chartered them to:

- Provide rapid connection of people with questions to people with relevant knowledge and expertise
- Enable and accelerate effective, efficient, and timely seeking, sharing, and adoption of value-adding practices, lessons learned, and new technologies
- Reduce the likelihood for repetition of mistakes
- Provide a link to internal and external information sources such as databases, previous studies and benchmarking data
- Enhance the retention of knowledge within ChevronTexaco

Mid-level management support and sponsorship are critical to a network's success. They work with subject matter experts to develop the business case, nominate a sponsor, help select leader and core team members, collaborate with the network leaders on the charter and operating plan, review progress periodically and engage peer management to make sure the right people are active network members.

Each network also has a senior executive sponsor who helps establish vision, strategic goals and expected value for the business; assists with acquiring resources and funding and looks for ways to gain visibility for and promote the value of the network.

Each network's charter and annual operating plan contains the following elements:

- Purpose, scope and business case
- Network goals and deliverables
- Roles, responsibilities and expected time commitment
- Network membership and typical member profile
- Governance
- Budget
- Metrics (process, behavior and results measures)
- Schedule of activities (monthly teleconferences, workshops, progress reviews)

For example, the Contractor Safety Management network has short-term goals focusing on communication and implementation support:

- Share successful practices, lessons learned and challenges faced
- Educate business units about CSM Team deliverables
- Assist BUs with deployment plans (implementation, logistics)
- Develop fluency in operating the Network
- Provide network access to external contractors

To sustain world-class performance in contractor safety, the network has longer-term goals focusing on understanding gaps and problems as well as improving practices:

- Maintain and develop standards over time. Proactively identify gaps in the system, develop and communicate new practices.
- Develop leading indicators that are predictive of success in the lagging indicators.
- Identify what is not working for business units and contractors. Improve implementation effectiveness.
    - Collect root cause data for incidents and analyze to understand the real problems.
    - Based on analysis of metrics, develop solutions to reduce incidents or their severity
- Identify, validate, transfer and apply new ideas, innovations and technologies.

OE Network Metrics

The OE network's main objective is to help business units close performance gaps and meet corporate expectations. Metrics that serve as leading indicators of corporate safety performance will help the networks adjust focus or guide members to practical intervention. Since explicit results will take time to materialize, we also have measures for process and behavior.

Results

- List of estimated benefits (members describe benefits gained as a result of implementation of a program, use of a tool, or development of a new practice)
- Pilot project reports (engagements with BUs to create an implementation action plan)
- Top 3 shared ideas or improvements each quarter

Process

- Percentage of BUs using the network's tools and guidelines
- Number of pilot programs
- Number of discussions between network members and BU leadership
- Survey of perceived value of networks by members and stakeholders

Behavior

- Participation statistics (# of members, # on conf. calls, # of BUs on conf. call)
- Website usage statistics (items shared, documents read, questions asked and answered)

Monthly teleconferences are an important part of the network's practice. A typical two hour agenda covers:

- Corporate safety performance and network metrics reviews
- Sharing of a serious incident with root cause and actions taken
- Focused topics (discussion on developments on a key deliverable)
- Successful practice sharing (presented by a BU network member)
- Open dialogue/Q&A (share successes, ask for and offer help)

The core team meets prior to the general membership teleconference to plan the agenda and solicit contributions. The core team also conducts occasional one-on-one interviews of members to better understand their issues and interests as well as to collect metric information on the use of the recommended guidelines and tools. Each network is supported by a collaborative website open to all employees that is used to publish successful practices, discuss issues, ask and answer questions, post meeting agendas and pre-reading, track actions and retain guidance, tools and other subject matter specific documentation.

Network Success Factors
Critical success factors for networks include clear business value, effective network leaders, and management support (including funding). For the OE networks, senior management support was the critical first step. Management initially identified the need for the networks and continue to champion them. Since these networks supported a strategic business goal and had specific deliverables, funding for time spent by the moderator (a 25-50% commitment during the initial network phases) and billable core team experts was justified. Network members were selected by their local management with an expectation to make participation a part of their job. The networks adapted readily available and inexpensive corporate web tools to facilitate collaboration and sharing.

Other Networks – Exploration and Production (Upstream)
"Seek, Share and Adopt" is the mantra of Technology Rapid Execution (TREx) networks that help ChevronTexaco's exploration and production (upstream) business units develop effective technology investment strategies and solve day-to-day operating problems. Capital and operating costs for the front end of our value chain are tremendous. This provides a large incentive for technical and operations staff to connect to transfer knowledge on cost-saving and performance-improving technology innovations.

Across upstream, 23 technical networks have been created. Once an opportunity is identified, network members are able to efficiently seek input and share experiences (good and bad) in order to speed up the adoption of effective proven practices broadly across the entire company. Global communication is facilitated by network email, web-based portal and other tools, contact lists and occasional in-person workshops.

Each TREx network is aligned with a Focus Areas such as: exploration, reservoir management, well systems, facilities and operations or health, safety and environment. In addition to these functional Focus Areas, there are also three asset based Focus Areas (Gas, Deepwater Development and Heavy Oil) and two transformative technology-based Focus Areas for a total of ten. The Focus Areas provide a framework for operating BUs and technology companies to identify and prioritize common challenges that can then be addressed with a technology investment strategy. Each Focus Area has a dedicated leader and set of Technology Management Team members that collaborate on a regular basis. This team's recommendations are then reviewed by a small set of senior managers from operating BU's and technology company that then have the responsibility to endorse technology strategies and approve resources for technology development projects.

Each TREx network has a leader, a group of six to ten core members and several hundred members from across all of the operating units around the world. Two-thirds of the core team are currently working in operating units with the remaining one-third in the technology company. This significant participation from operations helps ensure the topics being discussed are business related and that the tools developed are accessible. With network members working in such varied locations as 100 miles offshore on a drilling rig to a field office in the jungles of Indonesia, it is critical that access to the networks not be solely dependent high speed, high band-width internal networks. TREx networks use a variety of tools to allow users the opportunity to gain access in the most efficient manner from whatever location they are working.

Other Networks – Global Refining
"Quality Answers in Minutes Not Days" is one mantra of Global Refining Knowledge Management (GRKM). Prior to our merger, Chevron had created a number of best practice teams that recommended process equipment, process operating improvements and shared subject matter expertise for our U.S. based refineries. The merger more than doubled the number of refineries in our system, with all the additions located outside the U.S. In addition to expanding the best practice teams, we realized that the new refineries were not familiar with and had difficulty reaching our technical experts.

The Refining leadership team championed the development of a new global network to connect technical experts, refinery engineers and operators to enable them to search for answers or ask questions concerning day-to-day operating problems, to share successful practices, and to find a wide variety of refining knowledge in a single location. To ensure quick response to urgent questions, the web-based "portal" features an email-enabled process that directs questions to a subset of over 900 members who have registered their willingness to provide answers in a few of over 200 subject categories. Usually a question receives 4-5 responses within 24 hours. But if no answer is submitted, the question is escalated to technical experts who are responsible for the subject area.

In the past few months we have documented many similar examples that have contributed to operational excellence with multi-million dollar cost savings and avoidance of incidents and lost production.

Challenges and Next Steps

Although many of these networks are new, they are already making significant contributions to operational excellence. We still see gaps in the participation level and accountability of members, in reinforcement by senior management and in the engagement of affected business units. Some of our opportunities are:

- *Documenting and communicating network successes:*
  Many networks have metrics that include reporting successes involving knowledge transfer, thus data is being collected today. We will continue to encourage the management sponsoring a network to find opportunities to tell those stories at management and employee meetings. We will also look for opportunities to publish the stories on our corporate intranet.

- *Improving the skills of our network leaders:*
  Two objectives are planned for 2004. One is the network of network leaders. The second is to develop a practical curriculum for running virtual teams and networks.

- *Encouraging and reinforcing members to use networks as a part their normal work process:*
  This requires more communication of network successes – especially stories of how someone was helped in their job assignment, and recognition of those involved (from peers and from management).

- *Educating senior management on the important role of networks for short-term (improving operational excellence) as well as long-term (retention and knowledge transfer to new employees as senior staff begins to retire) benefits:*
  The network value proposition for OE, TREx and Global Refining is well understood by senior management sponsors. They have a responsibility to communicate the successes broadly to peers and throughout affected parts of the business to encourage more active participation.

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