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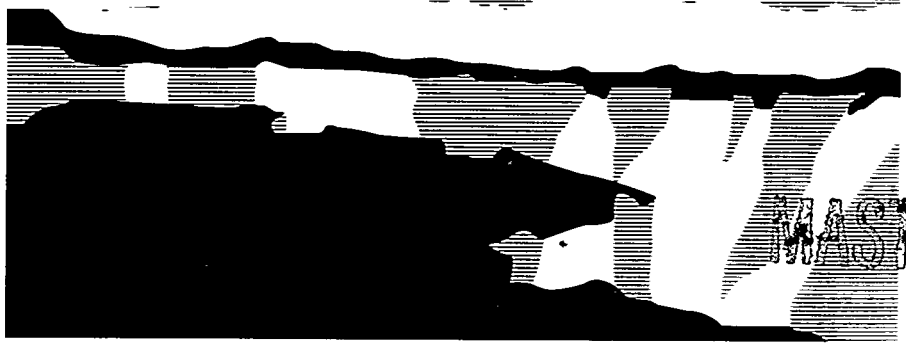

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Re-engineering Facilities Management at Los Alamos -- Managing the Behavioral Change

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Preamble

The Los Alamos National Laboratory is a multi-program research and development laboratory operated by the University of California for the Department of Energy. The laboratory was founded in 1943 as part of the Manhattan Project, bringing together the best scientific minds in the nation with the mission of building a nuclear deterrence for preservation of freedom in the world. The laboratory has major programs in nuclear weapons technology, non-nuclear defense, environmental preservation and restoration, health and biotechnology, and other areas of national importance.

Los Alamos has an annual budget of approximately $1.1 Billion and 7600 employees, 1550 of whom have Ph.D. degrees. The laboratory, located on high mesas in northern New Mexico, covers 43 square miles with over 7M square feet of space in over 2000 laboratories, offices and supporting structures, ranging from offices to critical nuclear materials research laboratories.

Today the laboratory's vision is to be a world class laboratory solving complex problems of national importance where science makes a difference. The laboratory will continue its special role in defense, particularly in nuclear weapons technology, and will increasingly use its multi-disciplinary capabilities to solve problems in the civilian sector. Recognizing the changing environment, major strides are being made in collaborations with US industry. Over 70 Cooperative R&D Agreements (CRADA's) are in progress and more than 15 separate spin-off companies have been created. The nuclear weapons program is responding to new priorities with increased emphasis on weapons dismantlement, control of proliferation, emphasis on development of technologies that can have dual use (both defense and commercial) as well as continuing stewardship of the existing stockpile. The laboratory has a strong tradition of ownership of its products from "cradle to grave", and this tradition bodes well for the future as it becomes more externally market driven.

Wake-Up Call

Events over the past three years have had the effect of a wake-up call for the laboratory -- the shift in emphasis of the nuclear weapons program, significantly

increased interactions with the private sector, and an exhaustive Tiger Team environmental, health and safety audit. Whereas the first 48 of our 51 years were characterized by a relatively shielded existence with single minded commitment to technical excellence, these events have signaled major change in our perspective. Moreover our people told us, through a lab-wide employee attitude survey, that we needed to make major changes in the way we manage the laboratory in terms of management behavior, management accountability and tying this together with incentive and reward systems. The survey also told us that our costs of doing business, driven by excessive bureaucracy and redundancy, were intolerable. An entitlement mentality, coupled with geographic isolation and high security consciousness, had, over the years, built up enormous administrative overhead. The clear message was a need to focus not so much on "what we do", but rather to emphasize "how we do it".

Management of Change

What have we done? Through the principles of total quality management we have begun the process of change under the banner of Continuous Quality Improvement (CQI). The laboratory director initiated the process at the conclusion of the Tiger Team assessment in November, 1991, articulating a stretch goal.

"I want to build a new way of operating our laboratory. I want us to be more productive and more efficient by adopting a quality management and continuous quality improvement approach. My goal is that in 5 years we will not only be the finest scientific laboratory in the world but also the best managed, most productive and most efficient."

Siegfried Hecker, November 15, 1991

Facilities Management

As part of this process of change and as a direct result of strong focus on environmental, health and safety (EH&S) compliance at the laboratory, an extensive review of the facilities management process was begun. A task force comprised of representatives from the major facilities as well as the major facilities services providers (i.e. operations, maintenance, facilities engineering, security and EH&S) was formed. The charter of the task force was to review the then existing model for provision of facilities services and to recommend changes that would more efficiently and effectively serve the laboratory's diverse facility needs. Specific focus was placed on establishing clear lines of management ownership and elimination of redundancy.

Prior to this study the laboratory had operated with a hybrid model of facility management. Some facilities were managed by the central organization and

others by the line organizations. This led to a diffuse system, with turbid lines of responsibility and authority. And as already noted, the entitlement culture, coupled with a tradition of isolation, led to excessive overhead costs and a "silo" mentality.

The task force recommended major restructuring of facility management based on a model in which facility management ownership would be distributed to the line organizations. The technical line organizations would own their facilities, the management of them and would be held responsible and accountable for safe and compliant operation. To implement the model, a new, high level career position was created -- a facilities manager for nuclear and hazardous facilities. These facility managers report directly to their cognizant technical division directors. Each division director is the facility owner and is ultimately responsible for the safe, secure and environmentally responsible operation and maintenance of their facilities. The division directors vest this responsibility in their facility managers. The facility managers thus become the central point of contact for facility equipment operations and have "Red Card" authority within the facility to close down operations for cause. To carry out their responsibilities each facility manager has a facility management support team, contracted from the central organization, reporting directly to the facility manager. Institutional coordination, career development, training and standards are set and monitored and facility managers are certified by the central organizations (i.e. a corporate model). Facility managers and their teams are financially supported by the line organizations.

A Method

The discussion thus far has centered on organizational structure issues and , to a lessor extent, on the process changes necessary to implement this model. What has not been discussed is a method to get there -- a method that defines the process for effecting the structural transition from the hybrid to the distributed model and a method that draws out the behavioral issues and barriers that tend to resist this change. We needed to develop a method that also engendered "buy-in" of those directly affected by this change and by the laboratory as a whole.

This was by far the most significant challenge -- the need to develop and apply a method to facilitate and enable cultural change. Also the method had to address the fact that no real data existed that identified the customer's needs when assuming responsibility for facility management in a distributed fashion. The service divisions did not know what the impact would be on their organizations and resources in a distributed model, and the actual process for distributed facility management was not defined. It was a process with no data to validate the requirements and impacts, and a new management system that was not defined.

We began the development of the method by understanding the principles that would serve as its foundation. The facilities management task force report served as the baseline concept for the implementation. The process was open to all stakeholders and adaptive to new learning and evolution over time. The principles of continuous improvement were applied to this interactive and iterative process, building new cross-functional relationships within the laboratory. The process addressed change in three areas: process definition and re-engineering, organizational change and behavioral change.

The method was designed as if a new management process was being put in place at each facility. The management process encompassed everything from strategic planning and budgeting for facilities to the detailed operation and maintenance of the facility systems themselves. The actual process tools that were chosen represented a broad spectrum: strategic planning, process mapping, root cause analysis, development of operating principles, business planning, project management, and behavioral change techniques.

The Approach

It was determined very early on that the methodology needed to be piloted to verify the approach, to gather the data needed to understand customer needs and to facilitate the re-engineering of processes that would support distributed facility management.

A diagram of the approach is found in Figure 1. Analysis was done by a team at each facility made up of line managers, the facility manager, additional cognizant facilities people and important stakeholders. The team was taken through a structured process that is broken into two distinct parts: AS IS and SHOULD BE. The AS IS portion of the process addresses the issues that define the current state of facility management and operations. The SHOULD BE process enables the team to design a new way of doing business, acknowledging that facility management is a cornerstone of the overall division strategy.

AS IS

The AS IS process leads the team through the identification of issues relating to facility management as well as division operations. The issues are stated in a cause/effect format that requires the team to clarify the intent of the issue. When the team has exhausted issue identification, an impact analysis is conducted. The impact analysis looks at how each issue will affect dollars (costs), sense of urgency (time), customer satisfaction and the safety risk. The intent is not to rank issues, but to assess the criticality of solving each issue when the planning process begins.

The team groups the issues by affinity and assigns a name to each group. From this point the group does root cause analysis on the categories of issues. The technique used for the root cause analysis is fishbone (Ishakawa) diagrams. This task allows the group to delve into the root cause of issues and expand the analysis to include topics that might not have been articulated in the original process. At the conclusion of this step the group has successfully identified the major issues they face and done root cause analysis across all categories.

SHOULD BE

The next step begins the SHOULD BE process. The group will review the fishbone diagrams for each of the issue categories and brainstorm a list of opportunities for improvement. This task begins the process of empowering the team to take ownership of the plan and, ultimately, to take ownership of facility management implementation. The next step is to develop the operating principles by which this group of managers agrees to make decisions. They look at the business rationale and implications of each principle to determine its viability as a rule for business decision making.

Once they have agreed to a set of principles, they begin the task of developing objectives for each group of issues. The objectives must be broad enough to establish the facility management program at their facility and address a minimal set of institutional requirements. From that point, action plans are developed for each objective.

Results

Four facilities were chosen to pilot this methodology. They were chosen to represent the wide diversity of needs across the laboratory and focused primarily on nuclear and high hazard operations. The four pilots integrate customer requirements representative of more than 50% of the entire laboratory.

Three of the facilities are implementing action plans derived from the SHOULD BE exercise. These action plans include:
1. Defining the resource loaded project management plan and schedule for implementation.
2. Staffing of facility support teams from the central organizations.
3. Defining and implementing the comprehensive operational baselines for safe operation (the so-called authorization basis) which includes operation and maintenance procedures for critical safety systems, their configuration management, change control and self-assessment.
4. Restructuring of line organizations to support the model and communication of the plan to the organizations involved.
5. Establishing customer driven metrics.

6. Defining budgeting and data base tracking requirements and driving the institutional initiatives to implement these needs.
7. Transferring the learning by developing and implementing institutional wide standards across the laboratory.

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Outcome and Benefits

From an individual division perspective, the completion of this process yielded more than just a plan to implement facility management. It moved each division from tactical responses to compliance to a more planned, strategic response. It established a planning discipline where fire-fighting had been. The re-engineering of facility management key processes in the distributed model with its strong line organization customer focus has eliminated many redundant and non-value added components of these processes. This will drive significant cost reduction at the laboratory. Cost-tracking and budgeting enable the laboratory to understand the true costs to run facilities. In addition the recognition of the need for formality of operations, especially for critical safety systems, and the unified approach to configuration management has had a profound influence on the establishment of institutional wide standards for facility management. And finally it began the process of integrating the service delivery process across the laboratory and is driving a unified approach to how service providers will respond to the requirements of their customers in this new environment. The next step outlook is shown in Figure 2.

The facility management model implementation is driving a bottoms-up strategic direction for the laboratory. It is enabling the divisions to look strategically at their facility need and plan as never before. It is also driving new behaviors within the organization. Cross-functional alliances have been achieved through this process. The method has been successful because it was adaptable, it enabled a division-level strategic planning effort, and the people experienced real team building through the process of working on a critical business problem.

References:

Figures: