

SANDIA REPORT

SAND2010-4717

Unlimited Release

Original Document

Issued (July 2010)

Technical Area V (TA-V) Transformation Project Close-Out Report

David Michael Wheeler
Nuclear Quality and Requirements

Malu Gawthrop
Epsilon Systems Solutions, Inc.

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Approved for public release; further dissemination unlimited.



Sandia National Laboratories

Issued by Sandia National Laboratories, operated for the United States Department of Energy by Sandia Corporation.

NOTICE: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represent that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, any agency thereof, or any of their contractors or subcontractors. The views and opinions expressed herein do not necessarily state or reflect those of the United States Government, any agency thereof, or any of their contractors.

Printed in the United States of America. This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

Telephone: (865) 576-8401
Facsimile: (865) 576-5728
E-Mail: reports@adonis.osti.gov
Online ordering: <http://www.osti.gov/bridge>

Available to the public from
U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Rd.
Springfield, VA 22161
Telephone: (800) 553-6847
Facsimile: (703) 605-6900
E-Mail: orders@ntis.fedworld.gov
Online order: <http://www.ntis.gov/help/ordermethods.asp?loc=7-4-0#online>



SAND2010-4717
Unlimited Release
Original Document
Issued (July 2010)

Technical Area V (TA-V) Transformation Project Close-Out Report

Nuclear Facility and Applied Technologies
P.O. Box 5800, MS 1145
Sandia National Laboratories
Albuquerque, NM 87185

ABSTRACT

In 2008, the TA-V department managers assessed the state of TA-V services and work activities to understand how to improve customer interfaces, stakeholders' perceptions, and workforce efficiencies. The TA-V management team initiated the TA-V Transformation Project after they deemed the pre-June 2008 operational model to be ineffective in managing work and in providing integrated, continuous improvement to TA-V processes. This report summarizes the TA-V Transformation Project goals, activities, and accomplishments.

Contents

Executive Summary	9
1. Reason for Pursuing TA-V Transformation.....	11
2. Challenges.....	13
3. Transformation Results in Brief.....	14
3.1. Strategic Planning	14
3.2. Strategic Thinking.....	14
3.3. Transformed TA-V Organization.....	15
3.4. Core Process Development	16
3.5. Quality Management.....	16
3.6. Configuration Management	17
3.7. Integrated Work Management.....	18
3.8. Strategic Communications	19
4. Transformation Project Description.....	19
4.1. Schedule and Budget.....	20
4.2. Scope.....	20
4.2.1. Phase I. Plan, Assess, and Communicate	20
4.2.1.1. Summit	20
4.2.1.2. Early Project Planning.....	21
4.2.1.3. As-is Process Mapping.....	23
4.2.1.4. Strategic Planning	24
4.2.1.5. Quality Assurance Working Group.....	24
4.2.1.6. Requirements Spreadsheet	25
4.2.1.7. Configuration Management Tool.....	25
4.2.1.8. HS-64 Corrective Action Response Coordination	25
4.2.1.9. Selection of Standards.....	25
4.2.1.10. Institute of Nuclear Power Operations (INPO) Assist Visit	25
4.2.2. Phase II. Create a TA-V Operational Model Designed and Engineered for Success.....	25
4.2.3. Phase III. Enable TA-V Operational Performance.....	26
4.2.3.1. Transformation Transition Team.....	26
4.2.3.2. Management Systems Team.....	26
4.2.3.3. Configuration Management Baseline Project.....	27
4.2.3.4. Work Management.....	27
5. Lessons Learned	27
6. Path Forward.....	29
6.1. Chartered Enabling Committees	29
6.2. Implementation Plan	29
6.3. Implement Configuration Management using eB	29
6.4. Disposition of People and Processes.....	29
6.5. Project Manager Close-out Report and Memo.....	30
6.6. Vision for 2014	30
6.7. Strategic Planning Session	30
7. Summary	31
References	32
Appendix A. Additional Resources Secured for TA-V Transformation Project	33
Appendix B. 10 CFR 830, Subpart A, “Quality Assurance Requirements”.....	34
Appendix C. TA-V Transformation Project Accomplishments	35
Appendix D. TA-V’s HS-64 Corrective Action Status	50
Distribution.....	53

Tables

Table 1. Pre- and Post- TA-V Transformation Project Staffing (including Sandians, contractors, interns)	12
Table 2. TA-V Pillars of Excellence and Associated Programs.....	16
Table 3. TA-V Functional Areas.....	22
Table 4. TA-V Stakeholders	23
Table 5. Functional Area Leads and Operations Staff Comprised Four Phase I Process Customer Service Teams.....	24

Figures

SNL TA-V Operations Facilities, Albuquerque, New Mexico	11
TA-V Logo	19

Acronyms

CATS	Corrective Action Tracking System, Sandia corporate database
CFR	Code of Federal Regulations
CY	Calendar year
DOE	U.S. Department of Energy
DOE O	U.S. Department of Energy Order
eB	Enterprise Bridge© configuration management software
ES&H	Environment, safety, and health
HS-64	DOE Office of Independent Oversight, Office of Environment, Safety, and Health Evaluations
INPO	Institute of Nuclear Power Operations
LESA	Laboratory Enterprise Self Assessment, Sandia corporate database
NNSA	National Nuclear Security Administration
NQA-1	Nuclear quality assurance
RREP	Research Reactor and Experimental Programs
SNL	Sandia National Laboratories
SSO	Sandia Site Office
TA-V	Technical Area Five

Acknowledgements

David Wheeler, TA-V Transformation Project Manager, won an *Individual Leadership Award* for the CY2010 Division 1000 Employee Recognition Awards for his exceptional leadership, outstanding devotion, and unwavering commitment to lead TA-V's Transformation Project. His courage to redesign the approach taken by TA-V to achieve mission success is admirable.

The success of the TA-V Transformation Project would not have been possible without the hard work of TA-V managers and staff who maintained TA-V operations during the transformation and contributed their time, ideas, and talent to project activities. Sincere thanks go out to everyone who participated, with special thanks to Paul Helmick, Deputy Project Manager, who demonstrated admirable dedication to this project.

Executive Summary

Sandia National Laboratories (SNL) Technical Area V (TA-V) has provided unique nuclear experimental environments for decades. The technologies tested in TA-V facilities have furthered the United States Nuclear Weapons program and has contributed to the national energy and homeland security mission. The importance of TA-V working efficiently to produce an attractive and effective platform for experiments should not be underestimated.

Throughout its brief history, TA-V has evolved to address multiple and diverse sets of requirements. These requirements evolved over many years; however, the requirements had not been managed nor communicated comprehensively or effectively. A series of programmatic findings over several years of external audits was evidence of this downfall. Today, these same requirements flow down through a new TA-V management system that produces consistently applied and reproducible approaches to work practices.

In 2008, the department managers assessed the state of TA-V services and work activities to understand how to improve TA-V's customer interfaces, stakeholders' perceptions, and workforce efficiencies. The TA-V management team initiated the TA-V Transformation Project after they deemed the pre-June 2008 operational model to be ineffective in managing TA-V's work and in providing integrated, continuous improvement to TA-V processes.

The challenges management faced included securing senior management support and Center 1300 director sponsorship, inspiring staff to embrace the concept of change, convincing staff to maintain their regular workloads while accepting additional responsibilities, hiring and training additional staff to support transformation initiatives, making multiple decisions that would create lasting change, addressing skepticism, and maintaining an optimistic attitude throughout the project. The enthusiasm that was demonstrated at the kickoff summit needed to be maintained by management throughout the project.

TA-V transformed the way it provides customer service while complying with its many regulatory requirements. TA-V staff became inspired to embrace change, seek new ways of providing customer service, and improve job satisfaction. The TA-V transformation emphasizes quality throughout its operations with optimized work processes including site-wide, integrated work planning, execution, assessment, and improvement. The TA-V Transformation Project significantly changed the approach in which TA-V manages its operations, mission, expectations, and governing requirements. The transformed TA-V is in a better position to accept the challenges of a changing DOE mission and the marketplace for radiation effects and nuclear technology.

Discernible improvements, as a result of transformation, include the following:

- The new TA-V management system organizes the staff and work into fourteen programs. Quality assurance is now integrated into each program to ensure that more than 5000 requirements applicable to TA-V are defined, accounted for, deployed, and implemented.
- TA-V's work is managed using an integrated work management model whereby TA-V work is prioritized and managed in bi-weekly management and program lead meetings. For the first time, TA-V work is incorporated into the *Integrated Master Plan* and *Integrated Master Schedule*, and programs use program annual work plans to implement the TA-V management system.
- Approximately 2500 documents and drawings were moved from the Excel-based TA-V master document list and other locations into eB (Enterprise Bridge©), a CMII-certified

configuration management software tool. The documents are change controlled, organized into specific document classes and types, and aligned with *TA-V Management System*.

- Examples of the forty DOE Office of Independent Oversight, Office of Environment, Safety and Health Evaluations (HS-64) corrective actions completed during the TA-V Transformation Project are the seven system design descriptions completed for the safety significant systems at the nuclear facilities:

Annular Core Research Reactor

- *Instrumentation and Control, System Design Description*
- *Plant Protection System, System Design Description, Annular Core Research Reactor Facility*
- *Wide Range Nuclear Instrument, System Design Description*
- *System Design Description, Annular Core Research Reactor Facility (ACRRF) Reactivity Control System (revision)*

Auxiliary Hot Cell Facility

- *Process Ventilation System, System Design Description, Auxiliary Hot Cell Facility*

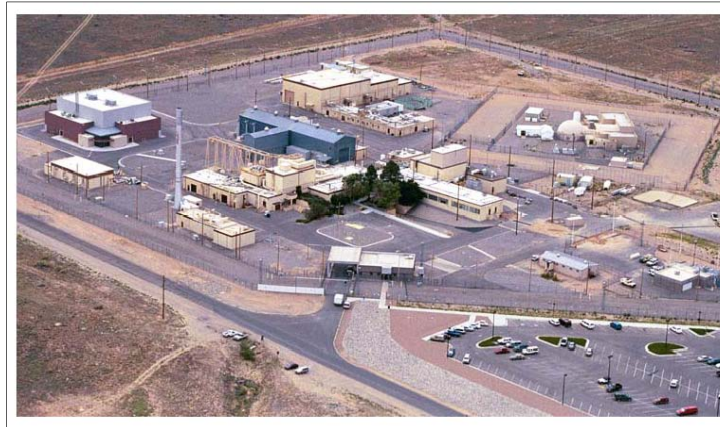
Gamma Irradiation Facility

- *Cell Source Elevator Power Interrupt Circuit, System Design Description, Gamma Irradiation Facility*
- *Radiation Area Monitor, System Design Description*

1. Reason for Pursuing TA-V Transformation

TA-V is the nuclear facility research complex at Sandia National Laboratories. TA-V has two research reactors, a gamma irradiation facility, and other facilities for experiments necessary for evaluation of radiation effects in materials of interest for nuclear weapons testing, and for other nuclear-related research. Because of its nuclear capabilities, TA-V is held to very high regulatory standards. TA-V contributes to applied radiation science capabilities including reactor design, nuclear weapon survivability, and radiation and fission detection.

Prior to transformation, TA-V lacked a single, defined mission and vision. TA-V was organized into five departments: two nuclear facility operations departments (which included nuclear materials management); nuclear safety analysis; applied nuclear technologies; and nuclear engineering, maintenance, and training. Having two operations departments resulted in varying approaches to conduct of operations, maintenance, and experimental planning. There was no specific department assigned to quality requirements as each department independently developed processes and procedures to fulfill respective requirements.



SNL TA-V Operations Facilities, Albuquerque, New Mexico

The responsibilities associated with each department were not well documented. Each department's scope of work and the division of labor was loosely based on agreements from previous management, and those agreements were inherited by new management and were modified as needed. Few roles and responsibilities were documented, and much of the work was expert-based and done by local practices passed from one staff member to another. This resulted in duplication of labor and gaps in performing necessary activities.

Resources were stretched and many staff members served multiple functions. The TA-V Transformation Project hired approximately fourteen full-time contractors to support the project and non-project work (appendix A). Operations staff, who work in buildings separated from the majority of TA-V, were particularly overburdened by the inefficiencies in work management. The post-transformation organization removed materials management responsibilities from operations by creating a new department (01386, Nuclear Materials Management). The responsibilities of quality, requirements, training, and information management were removed from the Nuclear Engineering and Maintenance Department by creating another new department (01382, Nuclear Quality and Requirements) (table 1).

**Table 1. Pre- and Post- TA-V Transformation Project Staffing
(including Sandians, contractors, interns)**

Operations and Client Services	May 2008	May 2010	Change
Operations (01381 and old 01382 [Nuclear Facility Operations Department])	20.5	18.5	(2)
01384 (Applied Nuclear Technologies Department, including customer service and experiment planning)	13.5	15.5	2
Subtotal	34	34	0
Support			
01380 (Sr. Mgt., finance)	4.5	4.5	0
01382 (non-operations) (Nuclear Quality and Requirements, [includes training and information management])	7.1	20.25	13.15
01383 (Nuclear Safety Analysis Department)	19.5	15	(4.5)
01385 (Nuclear Engineering and Maintenance Department)	22	14	(8)
01386 (Nuclear Materials Management Department)	0	6.6	6.6
Radiation protection	8	8	0
Subtotal	61.1	68.35	7.25
Total	95.1	102.35	7.25

Prior to transformation, compliance with DOE orders was assumed to be within the scope of the departments. For example, two departments managed nuclear facility operations (01381 and 01382) and were responsible for compliance with DOE O 5480.19, Chg 2, *Conduct of Operations Requirements for DOE Facilities*. The Nuclear Safety Analysis department was responsible for compliance with DOE O 420.1B, *Facility Safety*. The Nuclear Engineering and Maintenance department was responsible for compliance with DOE O 5480.20A, Chg 1, *Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities* and DOE O 414.1C, *Quality Assurance*. In spite of the fact that each of these orders contains requirements that are out of scope for that department's expertise, each department was committed to comply. This resulted in a patchwork of more than 300 local procedures and administrative documents, as well as the adoption of corporate processes, which imposed further redundancy and introduced the possibilities of gaps in compliance. Multiple corporate and TA-V local databases and software systems were in use that added to the difficulty in maintaining and demonstrating compliance.

The TA-V quality assurance program was based on a series of documents called Research Reactor and Experimental Programs (RREPS) that were developed to support experiments and incorporated principles of NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications." based on the quality criteria of 10 CFR 830, Subpart A, "Quality Assurance Requirements" (appendix B). The RREPS were not developed to address TA-V non-experiment work, and did not clearly flow down from the federal regulations and DOE orders with which TA-V was required to comply. The RREPs were reviewed and were maintained separately from department procedures. TA-V had no formal mechanism to integrate quality into programs, documents, or work processes. For several years prior to 2008, TA-V lacked a quality professional to oversee the quality program.

Prior to transformation, continuous improvement of TA-V processes had been encouraged by management: in 2005 a new department was created to manage DOE O 420.1B cognizant system engineering requirements; a value stream event in the spring of 2006 looked at the assessment process; a November 2006 Kaizen event initiated improvement of the condition reporting process;

and a summer 2008 Lean Six Sigma event improved the process to develop safety basis documentation. However, a series of external audits of TA-V programs (the last one prior to the TA-V Transformation Project was the January 2008 HS-64 inspection) resulted in findings that indicated the continuous improvements had not been adequate to prevent audit findings. Prior to transformation, managers responded to individual audit findings and assigned staff in a non-systematic way. This did not produce overall improvement or reduce audit findings. Specifically, short-term “band aids” were applied to problems due to lack of time or staff to adequately generate and implement lasting, integrated solutions, based on root causes.

TA-V talent had been tapped for special projects in the past with excellent results. TA-V staff were heavily involved in the Sandia Pulse Reactor restart and the Logistics Nuclear Operations Project, both of which were dedicated, short-term projects that concluded successfully. TA-V management was confident the same talent and attention, if applied to transformation, would produce equally impressive results for the future enduring work at TA-V.

In 2008, the TA-V management team concluded that re-engineering TA-V programs and processes would 1) break the cycle of receiving and responding to findings; 2) create a work environment that more directly and productively supports nuclear operations; 3) improve strategic, business, and operational processes; and 4) be fully compliant with quality assurance and other applicable requirements.

2. Challenges

Management faced many challenges: securing senior management support and Center 1300 director sponsorship, inspiring staff to embrace the concept of change, convincing staff to maintain their regular workloads and accept additional responsibilities, hiring and training additional staff to support transformation initiatives, making multiple decisions that would create lasting change, overcoming skepticism, and maintaining an optimistic attitude throughout the project.

TA-V management, with senior management and Center 1300 director support, kicked off the project with a three-day, all-hands summit, which demonstrated the commitment management had to dedicating the time and resources to transformation and emphasized the principle that the staff had to be fully engaged to make the transformation successful. Throughout the project, all-hands town hall meetings were held to continue the open communication started at the summit.

Departments were reorganized to better serve the project’s needs, and approximately fourteen additional staff were brought on board to help. Assistance included process improvement subject matter experts and quality professionals.

The project manager made numerous presentations to senior management to convey the work status, discuss ways to optimize change, and receive recommendations.

3. Transformation Results in Brief

Some of the results of transformation were surprising. In addition to the project successes described in this report, staff were empowered to contribute to enduring change. Line management met frequently, which resulted in stronger communications, a better understanding of each manager's needs, and creative solutions. Core issues identified at the summit were either resolved or a mechanism now exists to address remaining issues. (Section 6, Path Forward, describes these mechanisms in more detail.) A list of project goals, deliverables, and accomplishments is provided in appendix C.

3.1. Strategic Planning

TA-V management and key senior-level staff developed a strategic plan to outline broadly how the TA-V mission would be accomplished, and developed and implemented a strategic communications strategy to keep stakeholders informed of project status and progress (record¹ 14909). Strategic planning activities established the direction and guidance for TA-V's activities for the next five to ten years that align with customer needs and expectations. The strategic planning resulted in the following TA-V mission, vision, and goals:

- **Mission – *Why we exist***
 - To advance nuclear technology through applied radiation sciences and unique nuclear environments
- **Vision – *What we want to be***
 - Leading nuclear technologies vital to the nation
- **Goals – *What is needed to achieve the mission and vision***
 - Transform TA-V into models for leadership and continuous improvement
 - Display the cultural characteristics that make us proud of who we are and the work we do
 - Diversify the customer base while continuing to meet the needs of the current customers
 - Establish and maintain a positive relationship with all stakeholders
 - Maintain and improve sustainable nuclear facilities

3.2. Strategic Thinking

The TA-V Transformation Project generated many business improvement ideas. Many of these ideas will be addressed in the future, but more importantly, transformation has allowed TA-V staff and management to believe innovation and good ideas are worth pursuing and that success is achievable.

Multi-disciplinary teams including both management and staff were used extensively on the project. Team charters were developed to establish goals and to provide structure and commitment. For many staff, this was their first opportunity at TA-V to participate on diverse teams and meet the challenge of creating new solutions to complex, poorly defined problems in a radically new work environment.

¹ TA-V records are available from this report's authors or the <http://info.sandia.gov/TA-V/index.html> contact.

Program leads (a newly created role) enhance communication within and between programs, and are mentored by program owners, who are level 1 managers. Project management basics are taught including developing task scopes and schedules, identifying and assessing risk, prioritizing work, leading teams, and being accountable to management. Work was realigned to correct the duplication of labor previously exhibited and to fill gaps in performing necessary activities.

An inventory of requirements with which TA-V must comply was undertaken. These requirements now flow down through the TA-V management system to management programs to produce consistently applied and reproducible approaches to work management. TA-V management has asked program leads to assess their requirements and develop work plans to meet the requirements. The risks associated with the various programs are evaluated to assess risks based on existing staff, to determine if roles are correctly aligned with staff skills, and to assist in making strategic hiring decisions.

Transformation challenged the departments and programs to determine their service to TA-V and its customers, define themselves based on requirements, and attribute roles and responsibilities to staff. The program descriptions identify each program's interfaces, including dependencies on and services to, other programs. As these interfaces become more clearly defined, gaps will close and redundancy will be eliminated.

Sandia corporate resources were enlisted during the project. The increased understanding of corporate services has benefited TA-V, and continuing opportunities to enlist corporate support exist.

3.3. Transformed TA-V Organization

TA-V Management System and *Statement of TA-V Management Expectations*, two foundational deliverables of the TA-V Transformation Project, state that the TA-V management system is supported by four pillars of excellence and fourteen² TA-V management programs (table 2) that define the specific accountability and management elements (records 15286 and 15855). These management programs have discrete scopes that represent TA-V work without duplication and they also leverage aligned corporate support. The transformed TA-V has six departments. Each department manager owns one or more programs, and along with a program lead, has specific responsibilities to comply with requirements. Role-based positions provide a succession plan for continued program responsibility. *TA-V Management System* has been well received, and has demonstrated its ability to help management function more effectively and communicate across the organization more efficiently.

² The number of programs may change. Programs may be consolidated, created, or eliminated as transformation is implemented.

Table 2. TA-V Pillars of Excellence and Associated Programs

Four Pillars of Excellence	Management Programs
TA-V Organization Management Pillar prescribes a performance-based management approach to meet the TA-V mission and strategic objectives.	TA-V Business Management Program TA-V Integrated Work Management Program TA-V Assurance Management Program
TA-V Integrated Nuclear Safety Pillar prescribes the processes for effectively integrating safety into TA-V activities while applying rigorous requirements management and configuration for TA-V as a whole.	TA-V Requirements Management Program TA-V Information Management Program TA-V Nuclear Safety Management Program TA-V Training Management Program TA-V ES&H Management Program
TA-V Mission Management Pillar describes the process areas that define the mission of TA-V to provide nuclear facilities for innovative experiments, technical capabilities, and materials management to its customers and the corporation.	TA-V Applied Nuclear Technologies Management Program TA-V Applied Mission Management Program TA-V Material Management Program
TA-V Operations, Engineering, and Maintenance Management Pillar prescribes the TA-V processes for effectively integrating quality, safety, and other applicable requirements into its work while meeting and exceeding customer expectations.	TA-V Operations Management Program TA-V Engineering Management Program TA-V Maintenance Management Program

3.4. Core Process Development

TA-V defined its core business processes and documented streamlined customer work processes (record 14866). Four core process areas were identified that encompass the majority of TA-V's work. Process mapping included as-is, ideal, and future state high-level process flows that describe improved, effective, and efficient ways TA-V staff can accomplish work while applying the principles of a strong nuclear safety culture. The following core processes were created:

- Nuclear facility startup and restart
- Operation, maintenance, and modification of nuclear facilities
- Conduct of experiments
- High consequence material management

In addition, a prioritized list of improvement opportunities and suggested solutions, which will help processes run more smoothly and produce more consistent results, were identified, charted based on the relative benefit and difficulty of implementation, and prioritized in order of importance and benefits. "Parking lot" items (good ideas that were collected during meetings) were also captured.

3.5. Quality Management

The TA-V quality assurance program is now an integrated management system that ensures complete requirement definition, accountability, deployment, and implementation. This program includes TA-V organizational and implementing processes to ensure complete implementation of quality requirements, and is therefore not a separate, stand-alone document or quality system.

TA-V Management System, Statement of TA-V Management Expectations, and fourteen management program descriptions comprise the organizational quality process documents. These define the TA-V organizational structure, roles and responsibilities, requirements, and expectations that are deployed through the management programs.

TA-V quality implementing processes are designed to support TA-V in implementing quality requirements across organizational boundaries and are owned and developed by the respective management program accountable for the associated quality requirement. The TA-V Requirements Management Program is responsible for the management of the flow down of new and revised requirements and ensures requirements flow to the appropriate management program for implementation. All requirements applicable to TA-V are managed consistently through this process. Two independent audits will be performed to validate the new quality management system.

3.6. Configuration Management

Two programs that resulted from transformation are the TA-V Information Management Program and the Engineering Management Program. Together, these programs implement configuration management at TA-V: the TA-V Information Management Program develops processes for change control of TA-V information and documents; the TA-V Engineering Management Program manages the configuration and the change control process associated with safety systems, structures, and components.

Under the TA-V Information Management Program, TA-V initiated the use of eB (Enterprise Bridge®), a CMII-certified configuration management software tool, after benchmarking against the commercial nuclear power industry. eB integrates best-in-class enterprise content management with configuration management capabilities to deliver a powerful information management platform that ensures the delivery of relevant, trusted information to TA-V's business users. The software was installed onto a three-tier server architecture on September 30, 2008. This work continued in Phase II and Phase III as the Configuration Management Baseline Project. TA-V secured the help of a corporate matrixed project manager to implement eB. Programmers were trained on the eB software, and began importing the TA-V existing master document list of more than 2000 documents as part of a multiple phase process to establish eB as the configuration management tool. Staff were trained on basic eB navigation, and a SharePoint site was set up to provide additional eB assistance. Upon completion of baselining core TA-V information, eB will be used to enable the TA-V management system elements in a dynamic fashion (record 15468). Currently, documents are stored in the eB tool, with links to responsible program, document type, facility, and responsible owner. The next phase of the project will be the configuration of TA-V structures, systems, and components, as defined by the TA-V Engineering Management Program.

The TA-V Engineering Management Program had developed, under the pre-transformation department structure, the cognizant system engineer program. In the transformed state, it is realigning the roles and responsibilities of the system engineers to better manage the configuration management of systems, structures, and components. Planning is underway between the TA-V Information Management Program and the TA-V Engineering Management Program to incorporate the systems, structures, and components into eB.

3.7. Integrated Work Management

The TA-V Integrated Work Management Program is the foundation for all work at TA-V, and the catalyst in which all TA-V programs are integrated through formal management of prioritization, planning, and scheduling. The program establishes a common understanding of work and sets the expectations for how work is identified, managed, approved, and authorized. The program also describes the approach taken by TA-V to perform activity level step-by-step work through implementing processes and procedures. At the end of the TA-V Transformation Project, the TA-V Integrated Work Management Program initiated an integrated work management model by creating bi-weekly management team meetings to comprehensively identify, prioritize, and assign TA-V work.

TA-V has a team of project management and scheduling professionals who assist management to prioritize, plan, and schedule work throughout TA-V, using the following three tools:

- 1) The *Integrated Master Plan* is a fiscal year work plan developed and controlled by the Integrated Work Management team to help management identify, prioritize, and manage program lifecycle work and project deliverables that affect the programs. It is routinely updated as work is added, removed, modified, or reprioritized (record UN-0002).
- 2) The *Integrated Master Schedule* is a Primavera© schedule derived from the *Integrated Master Plan* that identifies the scheduled activities and milestones required to manage the work at the line level. The *Integrated Master Schedule* is the management tool used to quantify work that affects resources across the programs (record UN-0003).
- 3) Each program's annual work plan helps program owners and leads a) standup and improve program work; b) manage human resources, regulatory requirements, equipment, technology, and facilities; and c) interface with management and other programs. The program annual work plan feeds information into the *Integrated Master Plan* at the summary level and the *Integrated Master Schedule* at the detail and control level.

Four areas of work management were identified that now have a formal method or process under development:

- 1) Integrated work management – how work at various levels of the organization is integrated into the management programs, and how it is managed within the TA-V management system. It includes the *Integrated Master Plan*, which is managed by the program owner and the program annual work plan that is managed at the program lead level.
- 2) Program requirements and improvement work – work performed to improve the processes and procedures used by TA-V management programs to deliver products to clients.
- 3) Project management approach – work that entails enough risk or complexity associated with it to warrant using some level of the project management methodologies or the project management processes and the graded approach to execute the work within scope, cost, and schedule. Level 1 managers and the senior manager meet bi-weekly to prioritize, plan, and assign work to specific programs and projects. These work planning and prioritization decisions affect the success of the TA-V mission and therefore are judged at the highest level of the TA-V organization. The model uses the *Integrated Master Plan* and *Integrated Master Schedule*.
- 4) Activity work approach – activity work that inherently involves hazards and must be vetted and managed against the activity work planning and control procedure.

3.8. Strategic Communications

Strategic communications products unified the efforts of TA-V management and staff; transparently communicated transformation initiatives, achievements, and overall direction to staff, management, stakeholders, and regulators; and helped brand TA-V to support its goal of expanding its customer base. In addition, a specialty championship team-building contractor was brought in to help management and staff communicate more effectively to improve the TA-V culture (record 15758). Communication tools that were used routinely include leadership messages, newsletters, suggestion and feedback cards, availability of suggestion boxes, a new TA-V logo, front entryway marquees, posters, and TA-V town hall meetings (record 14906).



4. TA-V Transformation Project Description

The TA-V Transformation Project formally began in June 2008 and ended in December 2009. An all-hands TA-V summit took place June 16 through 18, 2008, to demonstrate both management's commitment to transforming TA-V and the absolute need for significant staff participation. The TA-V Transformation Project was chartered and funding was secured for a 19-month challenge. The *TA-V Project Management Plan* identified the following goals (record 14653):

- 1) Provide customer service using compliant and integrated strategic, business, and operational processes that meet the expectations for a strong nuclear safety culture
- 2) Ensure informational transparency for staff, management, stakeholders, and regulators
- 3) Improve, clarify, and simplify processing to allow TA-V staff to efficiently focus on safety, quality, and mission accomplishment, as a matter of routine

The project's purpose was to embed quality into TA-V processes by identifying requirements with which TA-V must comply and developing systematic and consistent TA-V work practices. The guiding premises throughout the project were the consistent application and incorporation of the principles for a strong nuclear safety culture and the quality criteria of 10 CFR 830, Subpart A, "Quality Assurance Requirements," (appendix B) into TA-V programs, processes, and activities. The project defined, documented, and streamlined critical work processes in a newly formed quality assurance framework described in *TA-V Management System* and *Statement of TA-V Management Expectations*. Associating the processes with clear and distinct roles, responsibilities, accountabilities, and authority was necessary to achieve this purpose.

This project concludes with this summary of the project activities, lessons learned (section 5), and a plan to implement the transformed management system (section 6). Implementation began in January 2010 and continues.

4.1. Schedule and Budget

The project duration was 19 months, from June 2008 through December 2009. Prior to the initiation of the TA-V Transformation Project, TA-V had a staff of 95. TA-V transformation required a 14 percent increase in staff brought in specifically to support the project (appendix A). This included full-time, part-time, student interns, and radiation protection staff. (Some staff were brought in on special assignment or less than part-time, resulting in an approximate number.)

4.2. Scope

The original scope of this project began as process re-engineering. As the project progressed, the scope was enlarged to incorporate core quality values into work, create effective management systems, emphasize and improve nuclear safety cultural attitudes, better align TA-V's activities to corporate efforts, and improve stakeholder relationships in order to truly transform TA-V. The project name changed from the TA-V Re-engineering Project to the TA-V Transformation Project.

The project had three major phases and additionally included managing TA-V's response to the HS-64 inspection:

- 1) Phase I – plan project activities
- 2) Phase II – create a TA-V operational model designed and engineered for success
- 3) Phase III – enable TA-V operational performance.
- 4) Management of the HS-64 inspection corrective actions

While no TA-V customer work or work required by the *Fiscal Year 2009 Sandia Performance Evaluation Plan* was suspended during the TA-V Transformation Project, numerous improvement and maintenance activities were either deferred or eliminated based on review of overall TA-V priorities and needs. Examples include deferring the following: 1) completion of the GIF 40-pin array quality receipt inspection and implementation, 2) the final fabrication and completion of the GIF basket manufacture and quality receipt inspection and implementation, and 3) the Sandia Pulsed Reactor/Critical Experiments modification and upgrade design initiative project. (These are all in progress as of May 2010.)

4.2.1. Phase I. Plan, Assess, and Communicate

Phase I involved project planning, developing a quality framework, process improvement exercises, and documenting current processes. Phase I was completed from June through December 2008.

4.2.1.1. Summit

TA-V held a three-day, all-hands summit to kick off the project June 16 through 18, 2008 (record 16336). A facilitator specializing in organization transformation was brought in to guide TA-V management through three energized days of idea exchange and process identification, mapping, and improvement. Most of TA-V's ninety-five staff attended. The summit was multi-purpose and included the following:

- Acknowledging that TA-V needed a new approach to managing quality
- Demonstrating management commitment to change from within due to our own desire for improvement
- Introducing the concept of “integrated management system”

- Sharing and gaining staff commitment to the transformation goals
- Engaging people in planning, designing, and launching the transformation
- Gaining understanding of “what’s working and what’s not working”
- Establishing work flow working groups
- Introducing and initiating systems-level work flow thinking versus compliance-oriented thinking

4.2.1.2. Early Project Planning

Early project planning established project roles and responsibilities and determined additional staffing needs. An existing TA-V department manager, David Wheeler, volunteered to be the project manager. A deputy project manager, Paul Helmick, was selected from existing staff. An interim reorganization was initiated to create a department that managed the TA-V information management, quality, document control and records, training, and assurance activities. This new department would be managed by the TA-V Transformation Project manager, so that TA-V work could immediately begin to align with project priorities.

From the beginning, project management emphasized the requirements of 10 CFR 830, Subpart A, “Quality Assurance Requirements” (appendix B). Requirements-based functional areas were identified (table 3) and leads were asked to ensure, throughout the project, that requirements be incorporated into project activities and deliverables. TA-V customers and stakeholders were identified (table 4).

Additional staffing needs were identified and secured, adding approximately fourteen full-time equivalents from six contracting groups and three Sandia corporate organizations over the 19-month project (appendix A). Approximately one-third of these additional staff were expected to become permanent staff, and two-thirds were expected to support TA-V only during the duration of the project.

Goals established to determine project success were documented in the *TA-V Re-engineering Project Management Plan* (later revised and renamed *TA-V Transformation Project Management Plan, Rev. 2*). These goals were prioritized and were associated with metrics and deliverables. Metrics and deliverables were established and will be used in the future to determine the success of the project. Appendix C, which lists project accomplishments, provides the status of the goals at the end of the project.

Table 3. TA-V Functional Areas

Functional Area	Scope to Represent in Team Meetings
Conduct of Operations	Operations, emergency response, DOE O 5480.19, Chg 2, <i>Conduct of Operations Requirements for DOE Facilities</i>
Occupational, Radiation Safety	10 CFR 835, "Occupational Radiation Protection," 10 CFR 851, "Worker Safety and Health Program"
Facility Safety, Cognizant System Engineer, Configuration Management	Facility safety, cognizant system engineering, configuration management, DOE O 420.1, <i>Facility Safety</i>
Programs, Security, Classification	Classification, special security, foreign national coordination, programs, Laboratory Directed Research Development
Safety Basis	Safety basis, documented safety analysis, 10 CFR 830, Subpart B, "Safety Basis Requirements," DOE O 425.1C, <i>Startup and Restart of Nuclear Facilities</i>
Property, Asset, and Maintenance Management	Nuclear and real property asset management, DOE O 430.1B, <i>Real Property Asset Management</i> ; DOE O 433.1, <i>Maintenance Management Program for DOE Nuclear Facilities</i>
Assurance	Assure, assess, improve, DOE O 226.1A, <i>Implementation of Department of Energy Oversight Policy</i> , Integrated Laboratory Management System
Criticality Safety, Nuclear Materials, Packaging and Transportation	Nuclear and radiological material management, criticality safety, DOE O 435.1, <i>Radioactive Waste Management</i> ; DOE O 460.1B, <i>Packaging and Transportation Safety</i>
Information Management	Information management, information technology, document control, records, computer aided design, DOE O 200.1, <i>Information Management Program</i>
Training	DOE O 5480.20A, Chg 1, <i>Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities</i>
Quality	10 CFR 830, Subpart A, "Quality Assurance Requirements" DOE O 414.1C, <i>Quality Assurance</i> DOE/NNSA Weapon Quality Policy (QC-1)

Table 4. TA-V Stakeholders

Role	Description
Customers (general)	DOE, National Nuclear Security Administration, Department of Defense, Department of Homeland Security, and other federal agencies that need reliable, high-performance, state-of-the-art nuclear environment testing; other DOE laboratories, and universities
DOE/Sandia Site Office	Sandia Site Office (as customer and regulator)
Experimenters	Highly sophisticated technical personnel who have unique needs, high standards of excellence, limited budgets, and schedules that are independent of TA-V's schedule; includes internal (SNL) and external (Los Alamos National Laboratory, etc.)
Internal Stakeholders	
TA-V Management	Senior and department managers who require consistent, efficient processes to provide customer services
TA-V Staff	Technical and administrative staff who seek fulfilling, challenging, and enjoyable work with opportunities to further their careers supporting work at SNL's TA-V nuclear facilities
Sandia Corporate Management	Managers whose performance metrics require more productivity under higher levels of scrutiny
Other corporate staff	Staff whose job functions require them to be present and interact with TA-V operations and facilities (e.g., facility, computer services, radiological protection, security, etc.)
Subcontractors, vendors	Non-Sandia staff whose job functions require them to be present and interact with TA-V operations and facilities
External, Non-customer Stakeholders	
Regulators (other than DOE)	Includes entities supporting the nation's interests, e.g., U.S. Environmental Protection Agency, New Mexico Environment Department, Occupational Safety & Health Administration, fire authorities, and other stewards of workers, the public, and the environment who are mandated to ensure work is conducted in compliance with their requirements.

4.2.1.3. As-is Process Mapping

The project categorized TA-V work into two categories and four customer service areas:

- 1) Unique Expertise
 - i) Research, experiments, testing, data, measurements, analysis
 - ii) Nuclear material management, handling, criticality safety, packaging/transportation
- 2) Unique Facilities
 - iii) Unique nuclear facilities
 - iv) Nuclear facilities startup and restart

Four customer service teams were created that mixed functional area subject matter experts with the customer service areas (table 5). Approximately forty-five TA-V staff participated on teams that documented as-is TA-V processes. Each team created as-is flow charts showing the current methods of completing TA-V work. The activity was an opportunity for staff to learn process mapping, to begin thinking critically about the way work is done, and participate in leadership roles.

4.2.1.4. Strategic Planning

A strategic planning meeting of managers and project staff was held October 17 and 24, 2009, to establish TA-V's mission, vision, goals, objectives, and metrics³ that together form the backbone of TA-V's operations and culture. *Technical Area V (TA-V) Strategic Plan: 2008-2010 Guidance for TA-V: A Transformation* documents the results on this meeting (record 14909).

Table 5. Functional Area Leads and Operations Staff Comprised Four Phase I Process Customer Service Teams

Functional Areas		TA-V Customer Services Team Members			
		D. Talley Mgt. sponsor	K. Reil Mgt. sponsor	J. Dahl Mgt. sponsor	D. Beets Mgt. sponsor
		Team 1 Experiments	Team 2 Material Management	Team 3 Unique nuclear facilities	Team 4 Nuclear facilities startup and restart
Functional Area	Lead	P. Cooper	C. Barth	L. Lippert	M. Burger
1. Operations	M. Burger	L. Martin	C. Barth	L. Lippert	M. Burger
2. Radiation Safety	A. Crowder	S. Luker	A. Crowder	M. Callahan	W. Mickey
3. Cognizant System Engineering/ Configuration Management	N. Hoadley	C. Montano	B. Melville	D. Wiedeman	N. Hoadley
4. Classification	P. Griffin	D. Vehar	D. Coats	P. Griffin	T. Quirk
5. Safety Basis	M. Black	S. Singh	M. Griffin	M. Black	M. Zimmerman
6. Property	R. Zaring	A. Higgins	D. Aaronscooke	D. Hanson	R. Zaring
7. Assurance	K. Deike	K. Deike	R. Gomez	K. Mulder	J. Garcia
8. Criticality Safety	N. Schwerts	M. Gregson	N. Schwerts	J. Miller	W. Strong
9. Information Management	T. Vanderbeek	T. Vanderbeek	T. Byroad	M. Gawthrop	M. Brunick
10. Training	E. Clemena	E. Clemena	R. Knief	A. Pierson	T. Abdalla
11. Quality Assurance	P. Helmick	T. Clark	P. Motyl	S. Trezza	D. Alsbrooks

4.2.1.5. Quality Assurance Working Group

A TA-V quality assurance working group of approximately seven staff members was chartered to ensure that details of transformation along with the construct of embedded quality elements would be integrated into the new transformed organization. This required developing a new framework in which TA-V would manage and implement its requirements. This work continued in Phase II and III. This framework is described in *TA-V Management System* that provides a logical, simple business system that categorizes the work at TA-V into pillars of excellence and management programs (record 15286). (This group evolved to become the Management System Team.)

³ Although metrics were developed, the project duration did not allow time for the metrics to be sanctioned. During the implementation phase, metrics will be revisited and incorporated as appropriate into programs' performance measures.

4.2.1.6. Requirements Spreadsheet

The quality assurance working group also identified the federal regulations, DOE orders, and standards with which TA-V must comply. The following DOE orders were emphasized:

- DOE O 414.1C, *Quality Assurance*
- DOE O 420.1B, *Facility Safety*
- DOE O 425.1C, *Startup and Restart of Nuclear Facilities*
- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE O 5480.19, Chg 2, *Conduct of Operations Requirements for DOE Facilities*
- DOE O 5480.20A, Chg 1, *Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities*

The specific requirements from these DOE orders, and other requirements, were placed into a spreadsheet to be managed by the TA-V Requirements Management Program and to eventually be distributed to the management programs for use when performing self-assessments and creating, modifying, and simplifying existing procedures (record 16036).

4.2.1.7. Configuration Management Tool

Section 3.6 describes TA-V's configuration management tool.

4.2.1.8. HS-64 Corrective Action Response Coordination

The TA-V Transformation Project began coordinating the HS-64 inspection corrective action responses, which had been under the management of four managers. Forty corrective actions addressed six HS-64 findings and weekly meetings were held to monitor progress and manage risks. Appendix D lists the HS-64 corrective actions.

4.2.1.9. Selection of Standards

The 10 CFR 830, Subpart A, requires identification of quality standards. TA-V adopted the ANSI/ANS-15.8-1995, *Quality Assurance Program Requirements for Research Reactors*, as the TA-V quality standard and *A Guide to the Project Management Body of Knowledge (PMBOK Guide)* as the project management standard. Formal adoption of specific nuclear industry standards is continuous across the fourteen management system programs where applicable and valuable to continuous improvement.

4.2.1.10. Institute of Nuclear Power Operations (INPO) Assist Visit

TA-V management invited representatives from INPO to perform an assist visit to emphasize and improve nuclear safety cultural attitudes (record 12967). INPO representatives visited from October 20 to 24, 2008. TA-V responded to the twelve gaps identified. Part of this response included the development of the human performance indicator handbook (record 898).

4.2.2. Phase II. Create a TA-V Operational Model Designed and Engineered for Success

Six months into the project, and with a year to go, Phase II began in earnest in January 2009. Phase II lasted six months, from January to June 2009.

In this phase, results of the Phase I as-is process mapping activities were selected and taken through process improvement exercises using Lean Six Sigma and theory of constraints techniques.

This included the prioritization and selection of desired work activities necessary to meet the end state objectives while maintaining and meeting customer expectations. Attention was also directed towards efforts to incorporate the goals and objectives identified during the Phase I strategic planning. Each process team considered the objectives as the new ideal processes were developed. Activities to comply with requirements were embedded into the ideal processes. This activity included process transformation teams working sessions, process improvement training, solidifying the as-is process maps, identifying requirements, and sequestered process transformation two-day events.

The results included ideal state process maps (free of constraints) and future state process maps (constraints, including requirements, inserted) for the following processes: facility startup and restart; operation and maintenance; modification, experiments, material management, safety basis, and training. Process mapping exercises resulted in numerous improvement ideas that were reviewed, combined when appropriate, and ranked by the process teams (record 14866). Facilitating the development of the future-state process maps were process improvement specialists from specialty contractors and the Sandia corporate organization 10602, Lean Six Sigma Operations Excellence Office.

At the end of Phase II, TA-V management and staff better understood the importance of defining processes and work flow, clarifying accountabilities, and supporting internal customers.

4.2.3. Phase III. Enable TA-V Operational Performance

Phase III, June through December 2009, enabled TA-V operational performance and implemented the new processes and tools. Three teams consisting of seven to ten staff members per team focused on specific topics.

4.2.3.1. Transformation Transition Team

The Transformation Transition Team was chartered to address operations process implementation. The significance of this team's scope required being chaired initially by a manager, and eventually, a senior staff member led the team. Although a number of different work flows associated with TA-V activities were identified, the Transformation Transition Team focus was limited to that of operations. The major work activities associated with the team were to examine the operations work flow and operations procedures. This examination included interviews with management and staff. The intent for the work flow was to 1) understand as much as possible about how work is done, and then 2) design in the necessary controls and intelligence to document how TA-V wants work processes to function in the future. The intent behind examining the procedures was to identify 1) gaps where procedures needed to exist, 2) activities that had multiple procedures, and 3) potential opportunities for procedure consolidation.

The Transformation Transition Team met frequently, sometimes daily, over the last half of the calendar year to address the charter items. The team was divided in half to address two specific and distinct issues: 1) examining TA-V operating procedures to determine redundancies, gaps, and inconsistencies and 2) focusing on documenting the work flow process for TA-V. This team's work is documented in *Summary of T3 Charter Activities* (record 16125).

4.2.3.2. Management Systems Team

The Management System Team (originally called the Quality Assurance Working Group) was charged with transforming TA-V from a department-based system with redundancies and gaps to a TA-V governance structure flowing down requirements to documented management programs (record 16396). Additional scope included identifying management expectations.

4.2.3.3. Configuration Management Baseline Project

Section 3.6 describes TA-V's configuration management tool.

4.2.3.4. Work Management

Section 3.7 describes TA-V's integrated work management activities.

5. Lessons Learned

A TA-V Transformation Project lessons learned meeting was held February 8, 2010. The results are summarized below:

1) Let the staff lead the way.

Organizational transformation benefits when management assigns leadership roles to the staff. Management leveraged staff members' strengths by asking them to lead and participate on teams to integrate requirements into TA-V's processes. Staff members were empowered and encouraged to take risks and to think differently when developing improved processes.

The lesson learned is, "Provide leadership and participatory opportunities to passionate, committed staff members to propel the project to success."

2) Create teams with people who normally do not work together.

The Phase I, II, and III team members were intentionally selected from different departments and areas of expertise. One of the project's greatest successes was the exchange between staff members who previously had not worked together. This resulted in increased peer respect, and a better understanding of how the organization works as a whole. Involving as many people as possible (while still having effective teams) assisted with staff members' buy-in on transformed processes. Mixing up teams resulted in new concepts and creativity that would not have been possible otherwise. As a result, the networking opportunities created during the TA-V Transformation Project will be long lasting.

The lesson learned is, "Transformation benefits when staff who normally do not work together have the opportunity to exchange ideas and develop relationships."

3) Expect and manage scope changes.

Transformation does not lend itself to traditional project management principles. Unlike projects that result in a deliverable, product, system, building, or a service, a transformation is the result of a series of steps with a vision for improved performance. Redesigning how an organization plans and conducts work includes the challenge of designing the path forward while building the path.

Defining scope, breaking it down into activities, and estimating durations and resources was challenging. Necessary course corrections resulting in scope changes throughout the project created some confusion and frustration. Some issues, problems, and priorities were not addressed when other unforeseen issues took precedence.

Project management consultants were hired to overhaul the TA-V work management system. Their work concentrated on developing an enterprise management system, the *Integrated Master Plan*, and the *Integrated Master Schedule* for TA-V work. The project redirected resources to develop better project management practices for the entire organization at the expense of adhering to strict project management principles.

Critical path activities were sometimes difficult to implement. For example, it is difficult to implement a tool (i.e., eB for configuration management) to model your business at the same time you are formally defining your new model for conducting the organization's business.

The lesson learned is, "Focus on scope changes and the impact those changes have on stakeholders. Communicate changes and benefits to stakeholders through tailored meetings and updated documentation."

4) Manage the overloaded work force.

TA-V maintained its operational activities throughout the TA-V Transformation Project. Managing priorities was complicated. Transformation required the participation of operations staff who were already heavily burdened. TA-V's work management tools were in their infancy, and staff were not relieved of responsibilities when additional TA-V Transformation Project responsibilities were added to their schedules. At the beginning of the project, it was anticipated that ongoing operations and the project teamwork capabilities would be stretched; however, management still had difficulty balancing the workloads and had to establish compensatory measures to support operations.

The lesson learned is, "Understand current workloads and the capacity to safely take on additional work before embarking on a major project; risk management is imperative."

5) Communicate with all levels of the organization, and tailor communication to stakeholders' needs.

Transformation requires discovery, and project management decisions were constantly needed on emerging information. A significant amount of the project manager's time was spent briefing upper management on transformation activities, from the initial stages of securing funding to giving progress updates throughout the project. TA-V management was briefed at weekly meetings, and all-hands staff meetings and newsletters were used to brief staff. Staff directly involved with the project required daily mentoring. Staff not directly involved in the project were either curious about progress or resistant to change. Keeping staff enthusiastic about transformation and overcoming the inertia of "doing things the ways things had always been done" required constant communication.

The lesson learned is, "Plan to spend a significant amount of resources communicating; tailor multiple communication methods to stakeholders; provide visual tools to help people understand the progress and concepts."

6) End the project with an implementation plan that can be executed.

Transformation is an ongoing process, and when the project is over, the transformation is just beginning. Not all scope items had been completed and many new scope items were discovered as part of the transformation efforts. The project ended with a list of "parking lot" items that had not yet been addressed, and new ideas were emerging. The project management anticipated a continued need to communicate and train stakeholders on the emerging aspects of the transformed organization. The TA-V Transformation Project built a foundation upon which the transformed organization will succeed, but the full measure of transformation will be a continuing journey.

The lesson learned is, "When an organization transformation project is complete, resources should be aligned and organized to implement the changes and continue the process."

6. Path Forward

Seven steps have been taken to ensure that transformation will be implemented at TA-V.

6.1. Charter Enabling Committees

TA-V now has several standing committees of managers and staff that are implementing and institutionalizing transformation. These committees augment the weekly managers meetings. These committees are:

- 1) Bi-weekly integrated work management meetings where program owners comprehensively identify, prioritize, and assign TA-V program and project work (initiated by the integrated work management model)
- 2) Bi-weekly program lead integration and improvement meeting where program leads build skills, develop processes, and ensure interfaces are in place
- 3) Bi-weekly managers' meetings to discuss transformation strategic planning
- 4) Condition review board meets weekly to review, risk-rank, prioritize, and assign tasks to address conditions adverse to quality

6.2. Implementation Plan

Throughout the TA-V Transformation Project, the magnitude of the changes being made and proposed became apparent. No longer accepting fixing problem with "band-aids," TA-V management committed to owning management programs, which would further develop and implement the transformed processes. An HS-64 deliverable, *TA-V Management System Implementation Plan* (record 15848), established a one-year plan to organize, self-assess, and improve the programs and associated processes. A key deliverable for each program is the program annual work plan, described in section 3.7.

6.3. Implement Configuration Management Using eB

The TA-V Information Management Program will continue to support configuration management processes that establish consistency among 1) the design requirements, 2) the actual physical configuration of the facility, and 3) the associated documentation for a) safety structures, systems, and components as defined in the DOE/NNSA-approved safety basis and for b) those safety structures, systems, and components that perform important defense-in-depth functions as designated by facility line management. This eB tool will also assist in maintaining consistency throughout the life of the facilities and associated activities, particularly as changes are being made. TA-V will manage information for TA-V facilities in order to achieve the consistency needed in configuration management of nuclear facilities, and to establish and maintain document control, records management, and software processes. This will support effective decision making in regards to TA-V programs, processes, and activities.

6.4. Disposition of People and Processes

As the TA-V Transformation Project ended, staff were realigned to appropriately fill program positions. The transformed roles and responsibilities of Sandia employees were incorporated into their performance reviews. All staff, including Sandians and contractors, were provided with new project

and task numbers to reflect the work they were assigned. Contractor staff positions were evaluated to determine which positions should be converted to Sandia positions to manage risk.

Program descriptions were written to realign the TA-V work to the programs developed during transformation. Programmatic process development that began during the project has been transferred to appropriate programs. The program annual work plans will prioritize the continuation of the work.

6.5. Project Manager Close-out Report and Memo

The TA-V Transformation Project manager concluded the project with a memo to each of the program owners (record 16617) and documented the project with this SAND report. The memo summarized the roles and responsibilities of the program owners and leads so that they would understand what is necessary to implement transformation. The memos included the following information:

- 1) Overview of the TA-V management system
 - Summary of the TA-V management system and expectations
 - The pillars and program structure
 - Assignments of program owners and program leads
 - Status of the program description and program annual work plan
- 2) Tools
 - Description of the *Integrated Master Plan*, *Integrated Master Schedule*, and program annual work plans
 - Instructions for using eB and accessing help when needed
 - Generic program owner and lead roles and responsibilities
 - New committee and meeting matrix stating the purpose and membership of each
 - The location of the requirements matrix that lists the requirements applicable to each program
 - A commitment that procedures to use these tools will be forthcoming, and that help using the tools is available prior to written direction and training

6.6. Vision for 2014

A vision for TA-V in the year 2014 was developed by two TA-V Transformation Project team leaders and delivered to management (record 16338). This vision is, in part, the result of working with the InSpirit Team and Championship Training, which emphasizes framing future possibilities by creating a vision of the future. The vision for 2014 began a lasting conversation about TA-V and its culture and direction.

6.7. Strategic Planning Session

Strategic planning sessions with TA-V managers have been conducted and are planned throughout 2010 and beyond to ensure transformation implementation continues.

7. Summary

TA-V is now in a strong position to ensure the unique nuclear experimental environments required by its customers are available due to work done during the TA-V Transformation Project. Improved customer service will be the direct result of project end-states for the following:

- Requirements are known and managed.
- Staff roles and responsibilities are defined.
- Staffing levels will be appropriate when in-progress and planned hiring is complete.
- Work processes are being improved and documented to improve quality, primarily through the use of the eB configuration management tool.
- Work is managed using project management principles and new management techniques, including strategic management meetings and the new leadership roles of the program leads.
- Work is organized by programs that have interfaces with other programs. Each department no longer needs to create in-house expertise for all disciplines and requirements, but can focus on fewer areas of expertise and integrate to work across other departments.

The end of the project does not signify the end of transformation, but rather the beginning. The implementation of transformation demonstrates the strong commitment by management and staff to leverage positive change to provide continuous improvement across TA-V.

Conducting nuclear operations in experimental environments poses unique opportunities for leadership and service to the nation. Inherent challenges are ever-present in order to work within the regulatory environment, develop a safety culture of excellence, meet customer expectations efficiently, and ensure all stakeholders clearly understand the operational envelope and integrated management approach. The investment required to “conduct nuclear operations” properly and with full integration should never be taken lightly. It is not only a monetary commitment of resources, but a dedicated management and leadership commitment to ensure our people, facilities, and processes are leading the way, and are never satisfied with the “as-is,” but are truly living continuous improvement as a cultural imperative!

References

- 10 CFR 830, “Nuclear Safety Management,” Subpart A, “Quality Assurance Requirements,” and Subpart B, “Safety Basis Requirements,” January 1, 2008.
- ANSI/ASME NQA-1-2008, “Quality Assurance Requirements for Nuclear Facility Applications,” includes Addenda A (2009).
- ANSI/ANS-15.8-1995, R2005, “Quality Assurance Program Requirements for Research Reactors,” September 14, 2005.
- DOE O 414.1C, *Quality Assurance*, June 17, 2005.
- DOE O 420.1B, *Facility Safety*, December 22, 2005.
- DOE O 425.1C, *Startup and Restart of Nuclear Facilities*, March 13, 2003.
- DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*, February 13, 2007.
- DOE O 5480.19, Chg 2, *Conduct of Operations Requirements for DOE Facilities*, October 23, 2001.
- DOE O 5480.20A, Chg 1, *Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities*, July 12, 2001.
- Project Management Institute, *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*, 4th Edition, December 31, 2008.
- Sandia National Laboratories, *Fiscal Year 2009 Performance Evaluation Plan for Sandia Corporation in the Operation and Management of Sandia National Laboratories*, Rev. 6, August 27, 2009.
- U.S. Department of Energy, Office of Health, Safety, and Security, *Independent Oversight Inspection of Environment, Safety, and Health Program at the Sandia National Laboratories*, April 14, 2008.

Appendix A
Additional Resources Secured for TA-V Transformation Project

Source and Scope	Approximate FTE	Role	Those staff who remained after project end
Bishop Management Associates, facilitation of the initial summit	(negligible)	Facilitator	
Booz Allen Hamilton, transformation and process expertise	4.5	Process and transformation specialists Project management professionals Graphic artists Communications specialists	
Epsilon Systems Solutions, quality assurance professionals and project management professionals	5	Quality professionals Project management professionals Regulatory specialist	Two full-time project management professionals One part-time quality professional One regulatory specialist
GenQuest Inc.© training assessment and improvement	.5	Training specialists	
Inspirit Consulting, championship team building and interpersonal relationships	.5	Communications specialists	
Sandia Corporate Engineering Management staff, information technology project management	.75	Information technology project manager	Information technology project manager (.75)
Sandia 10616 Business Office	.5	Business manager	
Sandia Corporate Lean Six Sigma, process improvement	.25	Process improvement black belts	
Sonalyt Engineering, system design description support	2	System engineers	One system engineer
Total	14		4.75

Appendix B
10 CFR 830, Subpart A, “Quality Assurance Requirements”

TITLE 10–ENERGY, Chapter III – Department of Energy, Part 830 – Nuclear Safety Management (Table of Contents)
Subpart A – Quality Assurance Requirements, Sec. 830.122 Quality assurance criteria

The [Quality Assurance Plan] must address the following management, performance, and assessment criteria:

- (a) **Criterion 1 – Management/Program.**
 - (1) Establish an organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the work.
 - (2) Establish management processes, including planning, scheduling, and providing resources for the work.
- (b) **Criterion 2 – Management/Personnel Training and Qualification.**
 - (1) Train and qualify personnel to be capable of performing their assigned work.
 - (2) Provide continuing training to personnel to maintain their job proficiency.
- (c) **Criterion 3 – Management/Quality Improvement.**
 - (1) Establish and implement processes to detect and prevent quality problems.
 - (2) Identify, control, and correct items, services, and processes that do not meet established requirements.
 - (3) Identify the causes of problems and work to prevent recurrence as a part of correcting the problem.
 - (4) Review item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement.
- (d) **Criterion 4 – Management/Documents and Records.**
 - (1) Prepare, review, approve, issue, use, and revise documents to prescribe processes, specify requirements, or establish design.
 - (2) Specify, prepare, review, approve, and maintain records.
- (e) **Criterion 5 – Performance/Work Processes.**
 - (1) Perform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means.
 - (2) Identify and control items to ensure their proper use.
 - (3) Maintain items to prevent their damage, loss, or deterioration.
 - (4) Calibrate and maintain equipment used for process monitoring or data collection.
- (f) **Criterion 6 – Performance/Design.**
 - (1) Design items and processes using sound engineering/scientific principles and appropriate standards.
 - (2) Incorporate applicable requirements and design bases in design work and design changes.
 - (3) Identify and control design interfaces.
 - (4) Verify or validate the adequacy of design products using individuals or groups other than those who performed the work.
 - (5) Verify or validate work before approval and implementation of the design.
- (g) **Criterion 7 – Performance/Procurement.**
 - (1) Procure items and services that meet established requirements and perform as specified.
 - (2) Evaluate and select prospective suppliers on the basis of specified criteria.
 - (3) Establish and implement processes to ensure that approved suppliers continue to provide acceptable items and services.
- (h) **Criterion 8 – Performance/Inspection and Acceptance Testing.**
 - (1) Inspect and test specified items, services, and processes using established acceptance and performance criteria.
 - (2) Calibrate and maintain equipment used for inspections and tests.
- (i) **Criterion 9 – Assessment/Management Assessment.**
 - (1) Ensure managers assess their management processes and identify and correct problems that hinder the organization from achieving its objectives.
- (j) **Criterion 10 – Assessment/Independent Assessment.**
 - (1) Plan and conduct independent assessments to measure item and service quality, to measure the adequacy of work performance, and to promote improvement.
 - (2) Establish sufficient authority, and freedom from line management, for the group performing independent assessments.
 - (3) Ensure persons who perform independent assessments are technically qualified and knowledgeable in the areas to be assessed.

Appendix C
TA-V Transformation Project Accomplishments

Appendix C - Contents

- I. Goals identified in the *TA-V Transformation Project Management Plan, Rev. 2*
- II. Deliverables listed in the *TA-V Transformation Project Management Plan, Rev. 2*
- III. TA-V Transformation Project-Specific and Programmatic Accomplishments
- IV. TA-V Transformation Project Deliverables in TA-V Records System

I. Goals Identified in the *TA-V Transformation Project Management Plan, Rev. 2*

The *TA-V Transformation Project Management Plan, Rev. 2* established goals for the project. Below is a summary of how these goals were met or will be met as transformation is implemented.

High Priority Goals

High Priority Goals	Status as of May 2010
1. Customer service/develop roles, responsibilities, accountabilities, and authorities. Provide quality customer service safely during the transformation process. Create a method to measure, value, and improve services to stakeholders. Share performance metrics and project progress with stakeholders.	The fourteen management programs owners, who are TA-V department managers, have completed program descriptions. Program annual work plans and performance measures are being developed.
2. Safety. Improve safety and operational culture at TA-V.	TA-V management invited representatives from the INPO to perform an assist visit to emphasize and improve nuclear safety cultural attitudes (record 12967). INPO representatives visited from October 20 through 24, 2009. TA-V responded to the 12 gaps identified (record 12967). Part of this response included the development of the human performance indicator handbook (record 15551).
3. Quality framework. Quality concepts will be understood by TA-V staff and integrated into work.	The implementation of the TA-V management system is integrating quality into work planning, processes, and execution.
4. Operational processes. Develop operational processes that bring about excellence in operations across the entire TA-V nuclear operations business unit. Operational processes are defined, documented, customer-driven, and deliverable-managed. Work and management process are not duplicated by other TA-V systems, and do not duplicate corporate mandated processes. Processes are derived from the TA-V quality assurance program.	The TA-V Transformation Project resulted in the quality-based TA-V management system that is supported by pillars of excellence and TA-V management programs that define the specific accountability and management elements (records 15286 and 15855). The management programs have discrete scopes that represent TA-V work without duplication.
5. HS-64. Correct the HS-64 inspection findings E-1, E-2, E-3, E-4, E-5, and E-6.	The HS-64 deliverables are listed in appendix D.
6. Complete the corrective action plan resulting from the root cause analysis on the deficiencies identified in the implementation of the Sandia TA-V nuclear safety quality assurance program.	CATS 2820 is the corrective action record associated with a May 14, 2008 memo from Stephen Ward to James Lee, subject: Non-Compliance with 10 CFR 830 "Nuclear Safety Quality Assurance Program" Implementation for TA-V (record 11680). A causal analysis was documented in an October 7, 2008 memo from Jim Lee to Rick Stulen. Four corrective actions were documented in CATS and closed, completed, and internally accepted on schedule. The validation of CATS 2820 has been initiated.
7a. Management tools. Create tools to manage TA-V work effectively and compliantly. TA-V managers will have information management systems that are necessary, defined, and maintained.	The TA-V Transformation Project initiated the use of eB (described in section 3.6, Configuration Management) and established a Sandia restricted network TA-V website http://info.sandia.gov/TA-V/index.html . The use of SharePoint sites for collaboration has also increased.

High Priority Goals	Status as of May 2010
7b. Management tools. Create tools to manage TA-V work effectively and compliantly. TA-V managers will have adequate staff to provide customer services (organization chart with all positions filled).	The management programs owners, who are TA-V department managers, are developing program descriptions and annual work plans that will roll up to a resource-loaded TA-V <i>Integrated Master Schedule</i> . A short-term and long-term staffing plan based on realistic work planning will be developed.
7c. Management tools. Create tools to manage TA-V work effectively and compliantly. TA-V managers will have a single set of resource and budget management tools necessary to prioritize, schedule, and manage work in a compliant and safe manner (resources loaded schedule, variances in schedule and budget within tolerance).	See section 3.7, Integrated Work Management.
7d. Management tools. Create tools to manage TA-V work effectively and compliantly. TA-V managers will have one way to integrate with corporate processes and tools; specifically, Center 1300, 1000, and the SNL corporation assets will be leveraged to support TA-V.	The management programs owners, who are TA-V department managers, have developed program descriptions and are developing annual work plans and performance measures that will include working cooperatively with corporate organizations.
7e. Management tools. Create tools to manage TA-V work effectively and compliantly. TA-V managers will have method(s) for management to communicate with TA-V staff to communicate management expectations easily (staff satisfaction compared to summit survey, no findings with causes of communicated management expectations).	Meeting this goal is a long-term outcome of the implementation of the TA-V management system. Throughout the TA-V Transformation Project, regular meeting were held to facilitate various initiatives. Several of these have become part of the implementation including bi-weekly integrated work management meetings so that the program owners (who are managers) can identify new work, status topics and projects, set priorities, assess risk, and manage resources. The alternate bi-weekly meeting with program leads is held to discuss quality topics as the programs are developed. The program owner/program lead structure was developed to provide a mechanism to communicate management expectations.
7f. Customer needs. TA-V customer base will be clearly defined. Past, current, and prospective customers and their needs will be identified.	The TA-V Applied Mission Management Program is dedicated to this goal, and will rely on the implementation of the fourteen TA-V programs.

Medium Priority Goals

Medium Priority Goals	Status as of May 2010
8. Quality documentation. Quality documentation will be reviewed and revised as necessary. An evaluation will be performed to determine if achieving an ISO 9000 recognized quality assurance program for integrated TA-V nuclear and experimental operations would benefit TA-V stakeholders.	TA-V adopted the ANSI/ANS-15.8-1995, <i>Quality Assurance Program Requirements for Research Reactors</i> as the TA-V quality standard.
9. Documentation umbrella. A common TA-V documentation umbrella and management process will be developed to define requirements, reduce the number of local governing documents, and simplify the document development, maintenance, and approval process.	The HS-64 deliverable E2-01 included the new <i>Document Lifecycle Management Procedure</i> (record RCDR-0025).

Medium Priority Goals	Status as of May 2010
10. Morale. A new work culture will be instilled in the TA-V staff and leadership. Employees will have a new sense of pride and morale associated with performing their work.	Meeting this goal is a long-term outcome of the TA-V Transformation Project. During the project, staff were empowered to contribute to enduring change. Line management met frequently, which resulted in stronger communications, a better understanding of each manager's needs, and creative solutions. Core issues identified at the summit were resolved, or now have a mechanism to be resolved. These successes have increased morale.
11. Condition reporting. Incorporate analysis from the TA-V condition reporting system (currently the condition reporting log) to guide project priorities; develop a system to ensure adverse trends from the condition reporting processes are aggressively addressed.	The TA-V Assurance Management Program has incorporated this goal into its program description and annual work plan. The TA-V Assurance Management Program meets with the TA-V Training Management Program and program owners quarterly to facilitate meeting this goal.
12. Stewardship. Provide a viable system to sustain improvements made as a result of this project.	An HS-64 deliverable, <i>TA-V Management System Implementation Plan</i> (record 15848) established a one-year plan to organize, self-assess, and improve the programs and associated processes. In addition, the TA-V Integrated Work Management Program staff meet with program owners (i.e., department managers) weekly to encourage adherence to the principles resulting from the TA-V Transformation Project.

Low Priority Goals

Low Priority Goals	Status as of May 2010
1. Skill building. TA-V staff who participate in the transformation will increase their skills in process optimization, consensus building, and leadership. Transformation provides an opportunity for staff to become Lean Six Sigma trained and certified.	Multiple opportunities for skill building were provided during the TA-V Transformation Project, including the following: <ul style="list-style-type: none"> • Training information technology staff on eB, a sophisticated configuration management program used by commercial nuclear power plants • Training TA-V staff on championship team building and communication • Training staff on process improvement techniques • Training staff on project management principles • Providing training on website development and maintenance • INPO-based soft-skill training for TA-V operations management • Human performance indicators for staff
2. Subcontractors. Streamline subcontract management.	The TA-V staffing plan resulted from the development of programs and the re-evaluation of positions that are best served by Sandians, performance-based contractors, and staff augmentation contractors. TA -V is also working with Sandia corporate organizations to appropriately fill positions that should be matrixed.

II. Deliverables Listed in the *TA-V Transformation Project Management Plan, Rev. 2*

The *TA-V Transformation Project Management Plan, Rev. 2* listed project deliverables. The status of these deliverables is summarized below. A list of project documents placed into the TA-V records system is at the end of this appendix.

Project Deliverables

Deliverable	Evidence of Completion
1. Documentation describing TA-V governance and quality assurance framework.	This was fulfilled by <i>TA-V Management System</i> .
2. Subordinate documents will include written policies that will flow down from the regulatory requirements with which TA-V must comply. Implementation plans will be created.	This was fulfilled by the following: <i>Statement of TA-V Management Expectations</i> <i>TA-V Business Management Program</i> <i>TA-V Assurance Management Program</i> <i>TA-V Requirements Management Program</i> <i>TA-V Information Management Program</i> <i>TA-V Nuclear Safety Management Program</i> <i>TA-V Training Management Program</i> <i>TA-V Applied Nuclear Technologies Management Program</i> <i>TA-V Applied Mission Management Program</i> <i>TA-V Material Management Program</i> <i>TA-V Operations Management Program</i> <i>TA-V Engineering Management Program</i> <i>TA-V Maintenance Management Program</i> <i>TA-V Project Management Procedure</i> <i>TA-V Management System Implementation Plan</i>
3. Documented processes for TA-V work activities are executed using common processes that are consistently and systematically applied. Documentation will be designed to address the requirements of 10 CFR 830, subpart A, "Quality Assurance Requirements."	The fourteen management programs will have processes that will comply with requirements. These processes are documented using the <i>Document Lifecycle Management Procedure</i> (record RCDR-0025), which is an HS-64 E2-01 deliverable due May 2010. The programs' annual work plans will document what processes will be developed, and provide an estimated schedule for completion.
4. A performance plan that establishes metrics against which effectiveness of the transformation can be monitored. This will include a documented method to redirect efforts to recover if metrics are not being met.	This deliverable is now the responsibility of the TA-V Assurance Management Program and is listed in their annual work plan.
5. Documented flow down of nuclear safety DOE orders into TA-V governing documents and processes	This deliverable was partially fulfilled by <i>TA-V FY2010 Plan to Close FY 2009 Performance Evaluation Plan 10.2.3 Identified Gaps</i> (record 15737), and is now the responsibility of the TA -V Requirements Management Program and is listed in their annual work plan.

Deliverable	Evidence of Completion
6. Work breakdown structure, integrated schedule, and staffing plan for TA-V work activities to facilitate TA-V resource management	This has been fulfilled by the <i>Integrated Master Plan</i> and <i>Integrated Master Schedule</i> , which are maintained on a SharePoint site and can be linked to through the TA-V website, http://info.sandia.gov/TA-V/index.html
7. Multi-year plan to monitor the success of transformation	Each program is developing an annual work plan and staff are being trained on performance measurement. The roll-up of this information into the <i>Integrated Master Plan</i> facilitates monitoring success.
8. Project closeout report with a list of accomplishments, final cost report, and documentation of a lessons learned event	This is fulfilled by this report.
9. Significant progress in standing up an effective configuration management tool (i.e., eB)	Significant progress has been made. The TA-V information technology staff have been trained in eB, have started programming and populating eB, and have trained TA-V staff to use eB. Documents are in the eB tool, with links to responsible program, document type, facility, and responsible owner. Section 3.6, Configuration Management, provides additional information.

Appendix C

TA-V Transformation Project Accomplishments

III. TA-V Transformation Project-Specific and Programmatic Accomplishments

This section lists project-specific and programmatic accomplishments. Project deliverables are listed in Section IV of this appendix.

Project Planning

- 1) Conducted first strategic planning summit with TA-V management, project and team leads, corporate Lean Six Sigma, and Booz Allen Hamilton staff, October 17th and 24th, 2008. Outcome results included the creation of TA-V's mission, vision, goals, and objectives.
- 2) Conducted second strategic planning summit with TA-V management and team leads, corporate Lean Six Sigma, and Booz Allen Hamilton staff, April 17, 2009. Outcomes included the prioritization of the "Top 20" process improvements from the four process teams, creation of the Transformation Transition Team, and the Configuration Management Baseline Project (formerly known as the eB Team).
- 3) Created concise definition of TA-V's customer services
 - a) Unique Expertise
 - i) Research, experiments, testing, data, measurements, analysis
 - ii) Nuclear material management, handling, criticality safety, packaging/transportation
 - b) Unique Facilities
 - iii) Unique nuclear facilities
 - iv) Nuclear facilities startup and restart

Tools

- 4) Created Sandia restricted network-based TA-V website launched in February 2010, <http://info.sandia.gov/TA-V/index.html>
- 5) Created and promoted use of TA-V Transformation Project SharePoint site
- 6) Branded TA-V with a logo and associated visual tools; created and distributed TA-V logos, posters, newsletters
- 7) Established a "war room" (Bldg. 6585, conference room 2900) to meet and post project-related materials
- 8) Conducted weekly process-flow-team mapping events
- 9) Established SharePoint site: https://sharepoint.sandia.gov/sites/TA-V_Re-engineering/default.aspx
- 10) Held weekly, then bi-weekly, meetings to coordinate HS-64 activities
- 11) Replaced the concept of "re-engineering" with "transformation"
- 12) Published and distributed the inaugural TA-V monthly newsletter that included frequently asked questions
- 13) Received commitment from the corporate Lean Six Sigma staff to provide up to three full-time staff members to support the transformation efforts
- 14) Set up project and task codes for appropriate charging of transformation activities

Appendix C

TA-V Transformation Project Accomplishments

Project Activities

- 15) Identified customer service team leads and members, and functional area subject matter experts, to begin the transformation efforts
- 16) Defined as-is roles, responsibilities, and accountabilities for the TA-V staffing plan, and further refined in the program descriptions
- 17) Phase I – highlighted by the Research, Materials, Unique Irradiation Environments Group, and Platforms teams developing as-is process maps. Teams included staff from all departments.
- 18) Phase II – continuation of Phase I to develop “future state” processes, and created the experiments, material management, operations and maintenance, startup and restart, and transformation teams. Teams included staff from all departments.
- 19) Phase II – created a TA-V quality assurance working group to ensure details of transformation, along with the construct of embedded quality elements, are integrated across TA-V departments; TA-V governance development was a priority. This became the Management System Team in Phase III.
- 20) Phase III – highlighted by the activities of the Management System Team, Transformation Transition Team, and Configuration Management Baseline Project activities
- 21) Assigned program owners and leads to the fourteen programs
- 22) Reorganized the six TA-V departments. The Re-engineering, Quality, and Training Department was created to support Nuclear Facilities Operations. The Nuclear Engineering and Maintenance Department (01385) concentrated on cognizant safety engineering and configuration management support to operations.
- 23) Created teams (Management System Team, Transformation Transition Team, and Configuration Management Baseline Project), developed charters and scopes of work, met regularly, and developed as-is process flow charts of the four core processes. Functional area subject matter experts participated in this process. Team materials are posted on the project SharePoint site.
- 24) Worked on HS-64 corporate issues with other corporate organizations

TA-V Governance

- 25) Created *TA-V Management System* and *TA-V Management Expectations Directive*
- 26) Re-aligned organization into programs with program owners (level one managers) and leads
- 27) Created a management meeting framework to organize communications between managers

Organization Management Programs

TA-V Business Management Program

- 28) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Business Management Program, which ensures compliance with federal requirements, DOE orders and requirements, and corporate requirements. This is accomplished through providing the following business management

Appendix C

TA-V Transformation Project Accomplishments

services to TA-V: financial, supply chain, human resources, and assistance with other business operations (Facilities, Training, Property, and Mission Execution).

- 29) Created financial work breakdown structure that mirrors the work activities work breakdown structure
- 30) Incorporated cost accounting standards into the work for others proposals

TA-V Integrated Work Management Program

- 31) Created the integrated work management program model whereby managers meet bi-weekly to prioritize and resource work across TA-V. TA-V management is now reviewing work to set priorities based upon requirements and the mission of TA-V as one organization.
- 32) Adopted the Project Management Institute's *A Guide to the Project Management Body of Knowledge* as the project management standard
- 33) Hired an additional project scheduler and a project controls specialist
- 34) Collected work in TA-V by department to develop the *Integrated Master Plan* and *Integrated Master Schedule*
- 35) Created standard work management environment. The Transformation Transition Team addressed implementation of a standard work management environment that focuses on how TA-V does work in the nuclear facilities. The team interviewed management and staff. This included how work is planned, controlled, and completed from cradle to grave. The work management environment addressed TA-V facilities operations, maintenance and surveillance, and modification processes. A graded approach methodology and embedded quality assurance will be incorporated into the environment.

TA-V Assurance Management Program

- 36) Created a spreadsheet of configuration management-related issues from previous assessments
- 37) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Assurance Management Program which instills, ensures, and documents a culture of continuous improvement for the TA-V organization by focusing on demonstrated compliance, improved results, and human performance excellence
- 38) Initiated a TA-V-specific worker feedback program which includes a dedicated email address and suggestion boxes
- 39) Formalized the condition reporting log and condition review board
- 40) Hosted an INPO assist visit
- 41) Created program annual work plans to manage the health and lifecycle of the program

Appendix C

TA-V Transformation Project Accomplishments

Integrated Nuclear Safety Management Programs

TA-V Requirements Management Program

- 42) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with how TA-V integrates requirements compliance into the management and work practices
- 43) Adopted the ANSI/ANS-15.8-1995 *Quality Assurance Program Requirements for Research Reactors* as the TA-V quality standard
- 44) Completed quality gap analysis (LESA 6376), assigned corrective actions
- 45) Developed a spreadsheet of requirements from DOE orders; identified the applicable TA-V implementing document; expanded the spreadsheet to include applicable standards criteria and corporate policy system policies, processes, and procedures
- 46) Created program annual work plans to manage the health and lifecycle of the program

TA-V Information Management Program

- 47) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Information Management Program, which ensures control, consistency, accuracy, and availability of information to support configuration management processes and mission-related needs. This also includes the management of the information systems, tools, and processes that ensures the information is properly controlled, accurate, easily accessible, in the correct format, and at the location required.
- 48) Configuration Management Baseline Project
 - a) Matrixed Configuration Management Baseline Project lead from corporate organization
 - b) Established eB as the configuration management tool
 - c) Enterprise Informatics design consultant visited TA-V to develop the TA-V implementing tool (eB) design specification
 - d) Installed eB configuration management software, and developed a project plan, project experiment quality plan, software quality plan, and schedule
 - e) Imported and validated the master document list into eB
 - f) eB populated with TA-V documents and data are associated between programs, owners, facilities, etc and implementation of eB being tested by users and new modules are in planning stages
 - g) Interviewed TA-V staff to support eB design specification. Topics included transformation, operations, the radioactive materials laboratory, experiments and analyses, document safety analyses design basis, master document list, master equipment list, document control, condition reporting system, and roles, responsibilities, accountabilities, and authorities.
- 49) Formed the Safety Software Quality Review Board
- 50) Held town halls to share information, status progress, answer questions, and highlight team successes
- 51) Completed document and record self-assessment (LESA 5979), assigned corrective actions

Appendix C

TA-V Transformation Project Accomplishments

- 52) Compiled the types and quantities of existing TA-V documents
- 53) Created program annual work plans to manage the health and lifecycle of the program

TA-V Nuclear Safety Management Program

- 54) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Nuclear Safety Management Program, which provides TA-V with a robust, healthy, and well-defined nuclear safety program that is in alignment with corporate and regulatory requirements
- 55) Completed a Lean Six Sigma event for safety basis activities

TA-V Training Management Program

- 56) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Training Management Program, which ensures that TA-V retains a workforce that is diverse and highly qualified
- 57) Created a training review committee to improve the training program
- 58) Created and distributed the human performance indicator booklets, revisions 0 and 1
- 59) Received assistance from the GenQuest Inc.© contractor for program improvement in training material development and instruction
- 60) Created program annual work plans to manage the health and lifecycle of the program

TA-V ES&H Management Program

- 61) Identified TA-V ES&H activities and proposed better ways to align and leverage Center 1300 and corporate support

Mission Management Programs

TA-V Applied Nuclear Technologies Management Program

- 62) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Applied Nuclear Technologies Management Program. This program applies nuclear physics and engineering techniques to national security and Sandia prime mission-related problems. The experiments core process is owned by this program.

TA-V Applied Mission Management Program

- 63) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Applied Mission Management Program. This program provides an interface between the TA-V Applied Nuclear Technologies Management Program and customers outside TA-V.

Appendix C

TA-V Transformation Project Accomplishments

TA-V Material Management Program

- 64) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Material Management Program, which provides a standardized, documented methodology, processes, and procedures for the management of material throughout their lifecycle in TA-V and ensures that material is managed in compliance with federal requirements, DOE orders and requirements, and corporate level requirements
- 65) Participated in the consolidation of the schedulers and project controls specialists into the TA-V Integrated Work Management Program

Operations, Engineering, and Maintenance Management Programs

TA-V Operations Management Program

- 66) Conducted an AHCF start/restart management system assessment and contractor operational readiness review
- 67) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Operations Management Program, which directs operations personnel in the command and control of activities in TA-V facilities, based on well-developed industrial operations practices that will contribute to safe and reliable operations
- 68) Developed human performance indicator booklets, revisions 0 and 1
- 69) Maintained operations safely while supporting TA-V Transformation Project activities

TA-V Engineering Management Program

- 70) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Engineering Management Program and defined how the program is structured; where requirements are implemented; how the program is managed; how the program is assessed to meet technical, regulatory, and quality assurance requirements; and the role the program plays in fulfilling specific organizational goals and objectives
- 71) Completed system design descriptions for active safety systems, as well as many other HS-64 deliverables
- 72) Provided matrixed support to the Sandia large-scale liquefied natural gas fire test to support Sandia's mission

TA-V Maintenance Management Program

- 73) Described and documented the purpose, scope, roles and responsibilities, interfaces, and processes associated with the TA-V Maintenance Management Program, which ensures the proper function and reliability of the TA-V hazard category 1, 2, and 3 nuclear facility structures, systems, and components within the scope of the program, as described in *TA-V Management System*. The TA-V Maintenance Management Program is the primary implementing mechanism for requirements under DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*.

Appendix C

TA-V Transformation Project Accomplishments

IV. TA-V Transformation Project Deliverables in TA-V Records System

TA-V records are available upon request. Contact this report's authors or the TA-V website contact at <http://info.sandia.gov/TA-V/index.html>.

Record ID (sorted by this number)	Title	Author	Date
898	HPI Handbook - Techniques and Tools for Human Performance Excellence and Error Prevention, Rev 0 and Rev 1	Wheeler, Dave	8/25/2009 12/1/2009
12303	Sandia National Laboratories TA-V Re-Engineering Project Management Plan	Wheeler, Dave	7/31/2008
12590	1300 SQA Gap Analysis Report	Trezza, Sherrie	9/30/2008
12591	TA-V Re-engineering Project Management Plan	Wheeler, Dave	9/30/2008
12592	TA-V Re-engineering Project Update September 30, 2008	Wheeler, Dave	9/30/2008
12628	Comprehensive Management Assessment of TA-V Programs and Processes Documentation	Wheeler, Dave	10/7/2008
12723	Request for Peggy Warner to lead a TA-V Document and Records Assessment	Wheeler, Dave	10/16/2008
12771	TA-V Re-Engineering Project	Raglin, Paul	10/28/2008
12967	INPO Team Visit Report	Hutcherson, George	11/7/2008
13049	Records and Documents assessment kickoff meeting – October 21, 2008	Warner, Peggy	10/21/2008
13050	Records and Documents assessment meeting – October 29, 2008	Warner, Peggy	10/29/2008
13062	Facilities Engineering Design Drawings CM 11-13-08 questions-comments final	Byroad, Theresa	11/13/2008
14653	TA-V Transformation Project Management Plan, Rev. 2	Wheeler, Dave	3/9/2009
14718	TA-V Management System (Rev. 0)	Wheeler, Dave	4/1/2009
14736	TA-V Management System (Rev. 1)	Wheeler, Dave	4/1/2009
14829	Technical Area V (TA-V) Strategic Plan: 2008-2010 Guidance for TA-V: A Transformation	Wheeler, Dave	4/9/2009
14857	Future State of the Tech Area V letter	Raglin, Paul	4/20/2009
14866	TA-V Transformation Project Deliverable: Future state process maps and improvement ideas	Gawthrop, Malu	4/14/2009
14867	TA-V FAQs	Raglin, Paul	2/19/2009
14868	TA-V newsletter February 2009	Raglin, Paul	2/1/2009
14870	Year In Review	Raglin, Paul	12/17/2008
14877	TA-V Newsletter March 2009	Raglin, Paul	3/1/2009
14878	TA-V Newsletter April 2009	Raglin, Paul	4/1/2009
14879	TA-V Town Hall, April 2009	Wheeler, Dave	4/27/2009
14880	TA-V A Transformation New Year Update	Wheeler, Dave	2/5/2009
14881	TA-V A Transformation, November 20, 2008	Wheeler, Dave	11/20/2008
14906	New TA-V letterhead, PowerPoint template, and logo	Gawthrop, Malu	4/2/2009
14909	October 24, 2008 TA-V Strategic Planning Offsite Day 2	Wheeler, Dave	10/24/2008
14910	April 17 2009 Management Offsite Out Brief	Wheeler, Dave	4/17/2009
14913	October 17, 2008 TA-V Strategic Planning Offsite Day 1	Wheeler, Dave	5/7/2009
15002	TA-V Newsletter May 2009	Raglin, Paul	6/1/2009
15143	TA-V Management System Project (MST) A phase III project of TA-V: A Transformation Charter	Helmick, Paul	6/15/2009

Appendix C
TA-V Transformation Project Accomplishments

Record ID (sorted by this number)	Title	Author	Date
15234	Request for corporate review and approval and independent Quality Assurance (QA) review of TA-V Quality Assurance Program Documents	Wheeler, Dave	6/22/2009
15235	TA-V Newsletter June 2009	Raglin, Paul	6/1/2009
15283	TA-V Project Management Procedure Number	Wheeler, Dave	6/30/2009
15284	TA-V Integrated Program and Project Management Manual	Wheeler, Dave	6/30/2009
15286	TA-V Management System (Rev. 2)	Wheeler, Dave	7/6/2009
15465	TA-V Town Hall, TA-V: A Transformation	Gawthrop, Malu	11/20/2008
15466	TA-V Town Hall	Gawthrop, Malu	6/25/2009
15467	TA-V Town Hall, TA-V: A Transformation New Year Update	Gawthrop, Malu	2/5/2009
15468	TA-V Configuration Management Baseline Project (CMBP) A phase III project of TA-V: A Transformation	Whittemore, Leanne	6/29/2009
15509	TA-V Re-engineering Functional Support at Tech Area V, August 2009 Status Report	Wheeler, Dave	8/11/2009
15515	Transformation Stakeholder Meeting, August 7, 2009	Wheeler, Dave	8/7/2009
15516	TA-V Town Hall August 14, 2009	Wheeler, Dave	8/14/2009
15554	TA-V Senior Manager Leadership Message, August 2009	Raglin, Paul	8/25/2009
15737	TA-V FY2010 Plan to Close FY 2009 PEP 10.2.3 Identified Gaps	Wheeler, Dave	9/16/2009
15758	Championship Organization Poster	Dudley, Shakti	9/15/2009
15768	TA-V Newsletter September 2009	Raglin, Paul	9/1/2009
15848	TA-V Management System Implementation Plan	Gawthrop, Malu	9/29/2009
15849	TA-V Requirements Management Program	Trezza, Sherrie	9/28/2009
15850	TA-V Information Management Program	Hoadley, Nels	9/20/2009
15852	TA-V Engineering Management Program	Zaring, Robert	9/29/2009
15854	TA-V Management System (Rev. 3)	Wheeler, Dave	9/28/2009
15855	Statement of TA-V Management Expectations	Wheeler, Dave	9/29/2009
15869	TA-V Management Expectations Directive	Raglin, Paul	11/2/2009
15979	TA-V Newsletter October 2009	Raglin, Paul	10/31/2009
16011	TA-V Training Management Program	Clemen, Evangeline	11/5/2009
16036	Requirements Matrix November 2009	Vanderbeek, Tom	11/1/2009
16048	Submittal of template and proofing checklist for program descriptions MST Charter deliverable: program manual template	Helmick, Paul	11/12/2009
16125	Summary of T3 Charter Activities	Gregson, Michael	12/16/2009
16133	TA-V Transformation Configuration Management Baseline Project Status	Whittemore, Leanne	12/18/2009
16145	TA-V Town Hall, December 17, 2009	Wheeler, Dave	12/17/2009
16179	TA-V Newsletter December 2009	Raglin, Paul	12/1/2009
16328	TA-V Newsletter February 2010	Raglin, Paul	2/1/2010
16336	TA-V Re-Engineering Project Summit Proceeds	Bishop, Elveta	6/25/2008
16338	Vision for TA-V in the Year 2014	Helmick, Paul Gregson, Michael	9/18/2009
16355	TA-V Performance Metrics Training Materials	Hickey, Bryce	2/24/2010
16396	MST Project Closeout	Helmick, Paul	3/10/2010
16487	Lists from TA-V Transformation Project for Future Consideration	Gawthrop, Malu	3/29/2010
16574	Transfer mechanism of 2009 TA-V: A Transformation Project work products from Booz Allen Hamilton to TA-V	Titus, Paul Engelmann, John	2/22/2010

Appendix C
TA-V Transformation Project Accomplishments

Record ID (sorted by this number)	Title	Author	Date
16574	Transfer mechanism of 2009 TA-V: A Transformation Project work products from Booz Allen Hamilton to TA-V	Titus, Paul Engelmann, John	2/22/2010
16617	TA-V Transformation Project Memo to Program Owners	Wheeler, Dave	5/17/2010
16629	Basis of TA-V Transformation Project Budget Conclusions	Gawthrop, Malu	5/17/2010
PD-0013	TA-V Integrated Work Management Program	Helmick, Paul	5/31/2010
PD-1101	TA-V Assurance Management Program	Trezza, Sherrie	11/12/2009
TAV-PD-001.1	TA-V Business Management Program Description	Cardoza, Sylvia	11/17/2009
TAV-PD-002	TA-V Nuclear Safety Management Program	Black, Michael	12/3/2009
TAV-PD-003.1	TA-V Applied Nuclear Technologies Management Program	Cooper, Phil	12/21/2009
TAV-PD-003.2	TA-V Applied Mission Management Program	Griffin, Pat	12/3/2009
TAV-PD-003.3	TA-V Material Management Program	Strong, Warren	12/3/2009
TAV-PD-004.1	TA-V Operations Management Program	Burger, Matt	12/7/2009
TAV-PD-004.3	TA-V Maintenance Management Program	Talley, Darren	12/3/2009
UN-0001	Requirements Traceability Matrix	TA-V Requirements Management Program	5/19/2010
UN-0002	Integrated Master Schedule	TA-V Integrated Work Management Program	5/19/2010
UN-0003	Integrated Master Plan	TA-V Integrated Work Management Program	5/19/2010

Appendix D

TA-V's HS-64 Corrective Action Status

Solution	Title	Due Date/ Date Submitted to SSO	Record numbers	Lead (Raglin)	SSO Verification Received
E-1.01	Establish the design limit and margin of safety for the FREC-II fuel by performing bounding clad structural analyses	1/15/2009 1/15/2009	13448 13697 16104	Dahl/Walker	14814
E-1.02	Revise the Annular Core Research Reactor facility documented safety analysis to clarify the discussion of the bounding parameters for FREC-II fuel failure	1/15/2009 1/15/2009	13448 13697	Dahl/Walker	14815
E-1.03	Ensure supporting reports/documents addressing design and performance testing of the FREC-II fuel are appropriately referenced in the documented safety analysis	1/15/2009 1/15/2009	13448 13697	Dahl/Walker	14817
E-1.04	Review documented safety analysis discussions on fuel cladding to ensure regulatory requirements are identified and addressed where applicable	12/15/2009 11/23/2009	16104	Dahl/Walker	16263
E-1.05	Validate corrective actions	6/15/2010	TBD	Dahl	TBD
E-2.01 revised	Revised E2-01 deliverable – additional TA-V quality program procedures for effective implementation of configuration management program	5/31/2010 5/13/2010	16608	Wheeler/ Clemen	16815
E-2.01	Request to extend HS-64 corrective action plan E-2.01	12/18/2009 12/18/2009	16132	Wheeler/Trezza	16200
E-2.01	Initial E-2.01 deliverable: CAP solution (deliverable), Office of Independent Oversight (HS-64) Corrective Action to Finding E-2.01	9/30/2009 9/29/2009	15856 15848 15845	Wheeler/Trezza	16049 16095
E-2.01	Request to change corrective action plan	5/28/2009 5/28/2009	15075	Wheeler/Trezza	n/a
E-2.02	Complete inclusion of outstanding configuration management related documents into TA-V document control	3/23/2009 3/12/2009	14703	Beets/Hoadley	15037
E-2.03	Improve change control-physical modification procedure	12/24/2009 12/17/2009	16176	Beets/Hoadley	16270
E-2.04	Develop formal drawing and specification procedures	7/30/2009 7/30/2009	15441	Beets/Hoadley	15741
E-2.05	Improve control of calculations	9/30/2009 9/21/2009	15774	Beets/Hoadley	16096
E-2.06	Control of vendor supplied documents	10/30/2009 10/28/2009	15955	Beets/Hoadley	TBD
E-2.07	Perform compliance gap analysis	7/11/2008 7/11/2008	12163	Beets/Hoadley	14810

Solution	Title	Due Date/ Date Submitted to SSO	Record numbers	Lead (Raglin)	SSO Verification Received
E-2.08	Develop implementation plan	8/15/2008 8/15/2008	12363	Beets/Hoadley	14812
E-2.09	Approve implementation plan	8/29/2008 9/22/2008	12459 12540	Beets/Hoadley	14818
E-2.10	Validate corrective actions	9/29/2010	TBD	Beets/Hoadley	TBD
E-3.01	Develop safety software quality assurance administrative instructions supporting TA-V <i>Software Quality Assurance Plan</i>	9/30/2008 9/25/2008	12588	Dahl/Trezza	14807
E-3.02	Training to the safety software quality assurance administrative instructions	11/30/2008 11/24/2008	12968	Dahl/Trezza	14808
E-3.03	Revision of TA-V <i>Software Quality Assurance Plan</i> to establish control of safety software specific quality plans	9/30/2008 9/26/2008	12588	Dahl/Trezza	14816
E-3.04	Develop a legacy software gap mitigation plan	12/15/2008 12/19/2008	13075	Dahl/Trezza	14806
E-3.05	Improve corporate change management process	8/29/2008 9/26/2008	12364	Dahl/Trezza	14809
E-3.06	Validate corrective actions	10/2/2009 9/29/2008	15853 16185	Wheeler/Trezza	16186 16333
E-4.01	Define roles, responsibilities, accountabilities, and authorities (R2A2)	6/30/2009 6/29/2009	15257	Beets/Deike	15358
E-4.02	Develop a resource-loaded project plan to implement the ES&H assurance process requirements developed by corrective action plan AP D-4 Solution D-4.02b	8/23/2008 8/21/2008	12383	Beets/Deike	14805
E-4.03	Develop the TA-V policy for condition and event reporting	12/31/2008 12/22/2008	13137	Beets/Deike	14822
E-4.04	Implement the condition reporting system	12/31/2009 12/17/2009	16183	Beets/Deike	16156
E-4.05	Validate corrective actions	9/30/2010	TBD	Beets/Deike	TBD
E-5.01	Revise TA-V operations documents	9/1/2009 9/1/2009	15609	Talley	15917
E-5.02	Document operational awareness process with appropriate tools supporting management operational awareness activities	1/29/2009 1/29/2009	13483	Talley	14819
E-5.03	Deliverable: Documented review of documented safety analyses and updated controls as required based on review	7/2/2009 6/29/2009	15260	Talley	15356
E-5.04	Revise control of procedures procedure for document review criteria Revise TA-V procedures	9/26/2008 9/25/2008	12546	Talley	14951

Solution	Title	Due Date/ Date Submitted to SSO	Record numbers	Lead (Raglin)	SSO Verification Received
E-5.05	Validate corrective actions	11/3/2009 10/27/2009	15964	Talley	16120
E-6.01	Develop system design descriptions	9/23/2009 9/21/2009	15767	Beets/Zaring	16028
E-6.02	Update cognizant system engineering program document	4/7/2009 4/6/2009	14793	Beets/Zaring	14949
E-6.03	Control of configuration documents	4/7/2009 4/6/2009	14793	Beets/Zaring	14950
E-6.04	Update cognizant system engineering system walkdown procedures	11/16/2008 11/12/2008	12899 12745	Beets/Zaring	14820
E-6.05	Implement performance monitoring and trending of vital safety systems	5/29/2009 5/20/2009	14963	Beets/Zaring	15357
E-6.06	Perform compliance gap analysis	7/11/2008 7/11/2008	12163	Beets/Zaring	14811
E-6.07	Develop implementation plan	8/15/2008 8/15/2008	12363	Beets/Zaring	14813
E-6.08	Approve implementation plan	8/29/2008 9/22/2008	12459 12540	Beets/Zaring	14821
E-6.09	Validate corrective actions	4/19/2010	16492	Beets/Zaring	TBD

CATS Numbers: E-1, CATS 2751

E-4, CATS 2755

E-2, CATS 2753

E-5, CATS 2756

E-3, CATS 2754

E-6, CATS 2757

Distribution:

1	MS 1141	D. M. Wheeler, 01382
1	MS 1141	J. D. Dahl, 01383
1	MS 1141	M. Gawthrop, 01382
1	MS 1141	M.E. Ratzer, 01382
1	MS 1141	M. J. Burger, 01387
1	MS 1141	P. H. Helmick, 01385
1	MS 1141	W. R. Strong, 01386
1	MS 1142	R. D. Beets, 01381
1	MS 1145	P. S. Raglin, 01380
1	MS 1146	K. O. Reil, 01384
1	MS 1169	J. R. Lee, 01300
1	MS 0899	Technical Library, 9536 (electronic copy)

