2017

A Qualitative Case Study Evaluation of a Government Workforce Training and Qualification Program

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COLLEGE OF EDUCATION

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2017

Abstract

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ME, Texas A&M University, 1980

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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April 2017

Abstract

In response to a 1993 oversight board recommendation, the U.S. Department of Energy (DOE) created a technical training and qualification program to address concerns about a shrinking workforce at defense nuclear facilities. The DOE Technical Qualification Program (TQP) applies to federal employees tasked with oversight, direction, and assistance to contractors at defense nuclear facilities. The purpose of this study was to determine the effectiveness of the TQP by ascertaining program effectiveness, program applicability, program impact on behavior and performance, and program impact on safety, from the participant perspective. Guided by Kirkpatrick's 4-level training evaluation model as the conceptual framework, this study used a goal-free evaluation approach. This program evaluation used a qualitative case study research design centered on a purposeful sample of 8 TQP participant interviews. Data were analyzed through coding and thematic analysis. Overall, TQP participants felt that the program was ineffective in preparing them for their jobs and that the applicability of the qualification requirements was low. Participants reported that the program did not improve job performance but had a positive impact on safety. Several recommendations were made to improve the program's effectiveness, including a comprehensive program evaluation and updates to training. Implications for social change include positive impacts on facility safety that may result in safer operations at DOE facilities that lead to fewer injuries to workers and the general public, and a reduced probability of release of hazardous materials to the environment. The results of this study may help site training officials improve program effectiveness and worker performance.

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Dedication

To my wife, Toni, and my two sons, Alexander and Brandon, who gave me the inspiration to follow my dream.

Acknowledgments

My sincere thanks go to Dr. Mary Ramirez, Dr. Edward Garten, Dr. Christian Teeter, Dr. Bonita Wilcox, and Karen Boardman for their support during this endeavor.

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Section 1: The Problem

Introduction

A primary goal of the Department of Energy (DOE) is to develop and maintain "a highly qualified, capable, and flexible federal workforce that can execute the mission in a safe, secure, efficient, and sustainable manner" (DOE, 2014, p. 20). In 1988, Congress created the Defense Nuclear Facilities Safety Board (DNFSB) to oversee and provide advice and recommendations to the Secretary of Energy regarding operations at defense nuclear facilities. This board is an independent agency in the executive branch of the federal government that works to ensure that adequate safety measures are employed to protect workers, the public, and the environment. In 1993, the board made a formal recommendation to the Secretary of Energy concerning the declining level of technical expertise at DOE defense nuclear facilities. Attrition, downsizing, and fewer young engineers interested in the nuclear weapons field resulted in concerns about the experience and knowledge level of the federal workforce (DNFSB Recommendation 1993-3, 1993).

Succession planning is a critical organizational issue. Many retirement-eligible baby boomers delayed retirement due to the 2008 recession. Due to an improving economy, a more concentrated departure of baby boomers is expected in the years following the recession (Chavez, 2011). This exodus of leaders, managers, and subject-matter experts, comprising as much as 40% of the workforce, will have a significant negative impact on organizational effectiveness and strategic planning unless replacement personnel are identified and developed (Chavez, 2011). These losses can be

minimized if agency succession plans include methods to identify, preserve, and reuse critical organizational knowledge. (Clark, 2015; Kaplan, 2013; Kowalewski, Moretti & McGee, 2011; Kurec, 2012; Leland, Carmen, & Swartz, 2012).

Among the specific recommendations from the defense board was for the DOE to review and improve training programs for technical personnel. The DOE responded with an implementation plan to create a formal, structured, technical training program and new training courses to support it (DOE Implementation Plan for DNFSB Recommendation 93-3, 1993). The Federal Technical Capability Program was created specifically to ensure that technical resources and capabilities are available to meet the requirements of the DOE's defense nuclear facility mission and operations. DOE Order 426.1, *Federal Technical Capability*, defines requirements and responsibilities related to the safe operation of defense nuclear facilities (DOE O 426.1, 2011).

A DOE defense nuclear facility is defined as a production or utilization facility operated for national security purposes and associated nuclear waste storage facilities, under the jurisdiction of the Secretary of Energy (DOE M 140.1-1B, 2001). Examples of DOE defense nuclear facilities include Idaho National Laboratory, Lawrence Livermore National Laboratory in California, and the Waste Isolation Pilot Plant in New Mexico. A complete listing of sites is included in Appendix B (Defense Nuclear Facilities Safety Board, n.d.; DOE O 426.1, 2011).

The DOE Technical Qualification Program (TQP) applies to federal employees tasked with oversight, direction, and assistance to defense nuclear facilities. Program participation is also required for federal employees tasked with evaluation of contractor

activities at those facilities. DOE Order 426.1 requires TQP participants to gain basic technical knowledge, technical discipline competency, and position-specific competencies. Basic technical knowledge requirements are met through completion of the DOE General Technical Base (GTB) qualification standard. The GTB qualification standard covers at a basic level how the DOE addresses topics such as environmental regulations, occupational safety, nuclear safety, and radiation protection. Technical discipline competency is demonstrated by completion of a functional area qualification standard (FAQS). There are currently 34 qualification standards covering areas such as nuclear safety specialist, fire protection, and occupational safety. A complete listing of qualification standard titles is included in Appendix C. If needed, knowledge requirements for position, facility, program, or office-specific qualifications are determined at the site. A locally developed qualification standard is then developed and issued to the designated participant. Two (GTB, FAQS) or three (GTB, FAQS, site) qualification levels must be completed before the participant is considered fully qualified in the TQP (DOE O 426.1, 2011).

Each defense nuclear facility site and its associated headquarters element must develop a unique TQP for its organization. The organizational TQP plan must include the following:

- Identification and assignment of employees/positions required to participate;
- Identification of qualifying officials to verify and certify qualifications;

- Identification of methods to evaluate knowledge appropriate to the competency or qualification, such as oral interviews, oral boards, facility walkthroughs, written examinations, or a combination thereof;
- Procedures to develop and maintain local qualification standards;
- Procedures to address level of knowledge shortcomings through requalification, re-examination, or other remediation methods;
- Procedures to maintain training and qualification records; and
- A listing of roles and responsibilities for participants and managers.

All TQP sites must conduct a program self-assessment at least every 4 years. Additionally, sites may pursue program accreditation from DOE headquarters if desired (DOE O 426.1, 2011).

The DOE National Training Center provides safety, safeguards, security, and protective force training to DOE federal and contractor employees. The Safety Training Program was established in December 2004 to provide a centralized source of training for employees with safety-related duties at DOE defense nuclear facilities. Several courses are designed to support competency requirements of the TQP (National Training Center, n.d.).

The following sections describe the local problem that prompted this study. Additionally, the manner in which the problem unfolds in the local context and in the larger population is presented in detail. The rationale for choosing this problem is presented with supporting evidence. Special terms associated with the problem are defined. Four research questions were developed and are discussed. The results of a

literature review are discussed and include a description of the conceptual base related to the problem. Possible implications of and directions for the project study based on potential findings are discussed, followed by a summary of important points of this section of the project study.

Definition of the Problem

Due to declining scientific and technical expertise at DOE defense nuclear facilities, a formal recommendation was made to the Secretary of Energy to recruit, train, and qualify technical personnel for defense nuclear facility programs (DNFSB Recommendation 1993-3, 1993). The DOE accepted the recommendation and created the Technical Qualification Program (TQP). A local DOE site employs approximately 40 TQP participants charged with the oversight and assessment of operations at various defense nuclear facilities. The problem is that the TQP has never been evaluated for effectiveness. There is no evidence indicating that participants perceive that the TQP meets the intent of the recommendation and the needs of the employees. Any issues found regarding the effectiveness of the TQP at the local DOE site might carry over to the larger population of over 1,200 TQP participants located at DOE sites throughout the United States. The potential hazards associated with production, processing, and manufacturing of nuclear materials within the DOE defense nuclear complex are significant and require dependence on highly capable personnel. Shortfalls in performance based on inadequate training can lead to unsafe operations resulting in harm to the workers, the public, and the environment (DOE, 2014).

Rationale

Evidence of the Problem

Jones and Welsh (2012) wrote that a lack of proper corporate oversight can result in negative consequences for employees, stakeholders, and society. Fundamental to proper oversight is the selection of experienced, trained, and qualified personnel to conduct oversight and assessment. Oversight activities must be continually monitored to ensure that those activities are valid (Kusserow, 2015; O'Neil & Kennedy, 2012; Shockley, 2015).

This problem was chosen based on the occurrence of incidents at the research study site. Short descriptions of a few of the incidents follow:

- An employee suffered a broken leg and burns due to the inadvertent firing of a rocket motor at a test track (National Nuclear Security Administration [NNSA], 2008).
- Two employees were injured when a steel stairwell and hoisting beam assembly fell during installation (NNSA, 2003).
- An employee suffered a hand injury during explosive device testing (NNSA, 2014).
- Failures to note potentially inadequate safety analysis at nuclear research facilities occurred on four occasions. Operations under conditions outside the bounding safety analysis could lead to incidents at these facilities (DOE Occurrence Reporting and Processing Database, 2016).

Although a variety of root causes led to the aforementioned incidents, the investigation reports listed shortcomings in oversight as contributing issues in each event. Managers failed to establish and implement oversight programs and processes that could have identified weaknesses associated with the root causes of the events. This issue was important to this study because oversight and assessment are primary duties of a TQP participant, are important competencies in the TQP, and are important concepts presented in several DOE National Training Center courses. Additionally, oversight and assessment are listed as duties and responsibilities in each TQP qualification standard (DOE Occurrence Reporting and Processing Database, 2016; NNSA, 2003, 2008, 2014). These incidents are possible indicators of an ineffective training program, or they may illustrate problems with the transference of knowledge, skills, and abilities presented in the program to the work site.

This project evaluated the effectiveness of the TQP from the participant point of view. Factors such as training program design and implementation, training program evaluation, worker attitudes, and workplace environment were assessed. The outcomes of this research provided recommendations to improve TQP design and implementation that could lead to better personnel performance.

Definition of Terms

The following terms are used throughout this report and were extracted from scholarly journal articles, DOE documents, and other appropriate literature.

Competency: The knowledge, skills, and abilities an employee must possess to independently perform related job duties (DOE O 426.1, 2011, Wu, 2013).

Defense nuclear facility: A production or utilization facility operated for national security purposes and associated nuclear waste storage facilities, under the jurisdiction of the Secretary of Energy (DOE M 140.1-1B, 2001).

Functional Area Qualification Standard (FAQS): A document that identifies the minimum technical competencies and supporting knowledge and skills for a designated work area (DOE O 426.1, 2011).

Learning transfer: Also referred to as *training transfer*, is defined as the application of knowledge or procedures learned in one setting to another setting (Foley & Kaiser, 2013; Joo, Lim, & Park, 2011).

Technical Qualification Program (TQP): A Department of Energy training and qualification program designated to train employees who provide assistance, guidance, and oversight at defense nuclear facilities (DOE O 426.1, 2011).

Significance of the Study

One of many DOE missions is the management and cleanup of hazardous materials from over 60 years of nuclear research and production. A highly qualified workforce is necessary to carry out this mission (DOE, 2014). The potential significance of an ineffective training program was illustrated by recent incidents at DOE defense nuclear facilities. The potential for more serious injury and loss of life was significant. Additionally, the release of significant amounts of radioactive or chemical contamination to the environment was also possible. Formal investigations of the incidents listed insufficient oversight as a contributor to the causes of the incidents. This study did not determine whether an ineffective training program caused these incidents, but it did

indicate a relationship between required job knowledge and TQP implementation. Improvements to the training program could lead to a lower probability of harm to workers, the general public, and the environment.

Research Questions

The research questions for this study were designed to gain an understanding of the perceptions of TQP participants on the effectiveness of the training program. Additionally, I sought to gain their perceptions of the value and contribution of NTC training courses to the TQP. The research questions were as follows:

1. What is the perceived effectiveness of the Department of Energy Technical Qualification Program among its participants?
2. What is the perceived applicability of the Department of Energy Technical Qualification Program among its participants?
3. How did the training program impact behavior or performance on the job?
4. How do participants describe the impact of the training program on safety?

Review of the Literature

The project study examined TQP effectiveness from the participant point of view. The goals of the literature review were to share the conceptual framework supporting the study and to examine concepts that relate to training program evaluation and training program effectiveness. Relevant sources were retrieved from DOE websites, defense-nuclear-facility-related websites, the Walden University online library, and appropriate textbooks. Specific databases utilized during the search included Education Research Complete, Academic Research Complete, and ERIC. Search terms included variants and

combinations of *learning transfer*, *training transfer*, *workforce training*, *workforce development*, *training programs*, *training program effectiveness*, *learning outcomes*, and *training program evaluation*. Saturation was reached when search terms returned the same sources and when remaining sources were deemed irrelevant to the study. The literature review is divided into several parts. In the first part, I discuss the conceptual framework for the study. The remaining parts address the factors or themes associated with training program evaluation and effectiveness, learning transfer, and training program design.

Conceptual Framework

The conceptual framework supporting this study was Kirkpatrick's training evaluation model. In 1959, Donald Kirkpatrick introduced a training evaluation model with four levels: reaction, learning, behavior, and results. Level 1, reaction, measures training program participant reaction. For example, was the participant satisfied with the training, and did the participant feel that the training was related to his or her work? Learner reaction can be measured using end-of-training surveys or interviews. Level 2, learning, measures whether knowledge, skills, or abilities were transferred to the participant during training. Level 2 evaluation can be accomplished using examinations or performance testing before and after training. Level 3, behavior, involves whether a change in behavior or performance at the job has occurred due to attending the training. After allowing time for change, surveys, interviews, and/or observations are conducted to evaluate behavioral changes. Level 4, results, involves evaluation of the final results of the training on a broader scale. These broader measures include factors such as increases

in productivity, decreased costs and mishaps, and higher profits (Karim, Huda, & Khan, 2012; Kennedy, Chyung, Winiecki, & Brinkerhoff, 2013; Kirkpatrick & Kirkpatrick, 2006; Saks & Burke, 2012, Shenge, 2014).

Workforce Development

In 2009, U.S. organizations spent over $125 billion on training. With such a large expenditure, those organizations should want to know if positive results in job performance were attained. Trainers are obligated to pursue evidence that training transfers to better job performance (Farrington, 2011).

Nemec, Gould, Seibold, and Rice (2012) wrote that workforce development activities send a message about the vision, mission, and principles of the organization. If training content is aligned with these three factors, then commitment from management is evident, and the likelihood of attainment is increased. Alzahmi and Imroz (2012) added that a primary mission of workforce education and development is to provide workers with the skills to become more productive and competitive in the labor market. Benefits of workforce development for employees include higher performance, promotions, lower stress, new skill development, and increased confidence. Benefits to employers include improved work quality, increased workforce motivation, and increased workforce creativity (White, 2012).

Training needs assessment. Although strategic plans, mission statements, and vision statements identify the goals and objectives of an organization, a training needs assessment is necessary to determine if training is needed to address those goals and objectives, and, if so, what type of training is required. Some issues or problems are

better addressed by redesigning the job or changing procedures instead of conducting training. Determining training needs can also be helpful in measuring current and desired performance and knowledge levels.

One method of conducting a training needs analysis involves asking the employee to provide a list of desired training courses. Unfortunately, this method usually results in a list of training "wants" instead of training "needs." A more thorough individual analysis involves observation, interviewing, and testing of the employee followed by training to offset identified deficiencies.

Related to the individual analysis, an operations/task analysis needs assessment addresses the knowledge and skill requirements of each job or task. Factors such as attendance, behavior, productivity, and mishaps are reviewed. Training is developed to meet gaps between required performance and actual performance.

An organizational-level analysis considers the goals, resources, and future needs of both the organization and the worker. Performance data are analyzed to determine whether training can address problem areas. Employee demographics, anticipated technology changes, and regulatory issues are also considered in this type of analysis. Data should be collected at all three levels of analysis in order for the needs analysis to be effective (Bartlett, Schlief, & Bowen, 2011; Cekada, 2011; Dachner, Saxton, Noe, & Keeton, 2013; Ofluoglu & Cakmak, 2011).

Learning transfer. Learning transfer, also referred to as *training transfer*, is defined as the application of knowledge or procedures learned in one setting to another setting (Foley & Kaiser, 2013; Joo et al., 2011). MacRae and Skinner (2011) added that

learning transfer occurs when knowledge and skill acquired from training are applied on the job and maintained over a period of time. Identical Elements Theory points to a basic requirement of any training program. The elements or content of the training must parallel and reinforce the required performance at the work location to be relevant (Taatgen, 2013). Failure to maximize learning transfer will result in wasted resources and could make employee retention more difficult (Grohmann & Kauffeld, 2013).

Farrington (2011) and Ford, Yelon, and Billington (2011) wrote that as little as 10% of training content is transferred back to the job site in the form of behavioral change. Factors related to the amount of transfer can be grouped into three general categories: learner attributes, workplace environment, and training design. Once identified, organizations can develop strategies to enhance those factors and increase transfer (Brown, McCracken, & O'Kane, 2011, MacRae & Skinner, 2011).

Grossman and Salas (2011) wrote that trainee characteristics or learner attributes are a significant factor for learning transfer. MacRae and Skinner (2011) described cognitive ability to understand training, sufficient self-efficacy, and motivation level or attitude as factors moderately to strongly related to learning transfer. Job satisfaction and satisfaction with training are additional factors associated with learning transfer (Joo et al., 2011; Latif, Jan, & Shaheen, 2013).

Work environment as related to learning transfer includes factors such as peer support, supervisor support, workplace climate, and organizational support. Hua, Ahmad, and Ismail (2011) wrote that employees who lacked the opportunity and support to use learned skills faced a significant obstacle for transfer. Peer support, consisting of

encouragement from immediate coworkers and peers, is important in promoting the use of newly learned skills on the job (Bhatti, Ali, Isa, & Battour, 2014; Grossman & Salas, 2011; Saks, Salas, & Lewis, 2014).

Supervisors monitor and direct the use of newly learned skills at the worksite and determine how quickly new skills should be applied. Additionally, supervisors who also assume roles as mentors and coaches promote higher employee confidence (self-efficacy) and trust in the organization. This results in employees transferring learned behavior to the job more easily (Bhatti, Ali, Isa, & Battour, 2014; Clarke, 2013; Grossman & Salas, 2011; Hua, Ahmad, & Ismail, 2011).

Learning transfer is more likely when workers perceive positive support from the organization with respect to the use of newly learned skills. Positive feedback and reinforcement motivate employees and foster behavioral change. Organizations that create a learning-friendly climate also enhance learning transfer (Crouse, Doyle, & Young, 2011; Egan, 2013, Ehrhardt et al., 2011; Franke & Felfe, 2012; Grossman & Salas, 2011).

Training design. Numerous training designs, techniques, and strategies have been presented as methods to promote learning transfer. A fundamental requirement for successful learning transfer is that the training content must complement job knowledge needs. Performance is enhanced when training and related tasks share common features (Konidaris, Scheidwasser, & Barto, 2012). McDonald (2011) added that a student-centered learning strategy leads to a more effective learning transfer process.

Tabassi, Ramli, and Bakar (2011) defined training and development as "a process of systematically developing work-related knowledge and expertise in people for improving performance" (p. 511). Properly designed workforce development ties organizational objectives to training objectives. Additionally, training departments should consider tying wages and promotions to learning activities and goals, developing curriculum to encompass the goals and needs of customers, and developing partnerships with higher education institutions (Abel, 2012).

"Technical competences or 'hard skills' define what people should know and be able to do (knowledge and skills) in order to successfully fulfill their roles" (Campeanu-Sonea, Sonea, Gabor-Supuran, & Muresan, 2011, p. 48). The TQP utilizes a knowledge, skills, and abilities (KSAs) competency model to train program participants. The program qualification standards identify minimum competency requirements and supporting knowledge and skills for individuals in each technical area. Participants must demonstrate competency attainment by completion of an oral and/or written examination, and when appropriate, by being observed performing a task or activity related to the competency (DOE O 426.1, 2011). Some organizations use KSAs to evaluate the past experiences and qualifications of potential job hires (Kasser, Hitchins, Frank, & Zhao, 2013).

Wu (2013) listed five important factors for competency-based training programs:

1. Training processes must align with organizational goals and plans.
2. Competency based training works best with high-performance organizations composed of high performance employees.

3. Training design and content must match the competency model.
4. Gaps between actual and desired competency levels must be defined.
5. Training is designed to address competency gaps.

Workforce development for government agencies is complicated by lack of competition and profit motivation. In the private sector, poor workforce performance can lead to falling profits, loss of market share, and possibly business failure. Government agencies are not faced with nor held accountable for competition or profit issues. Instead, they are tied to an annual budget cycle that makes it more difficult to focus on a long-term investment such as workforce training and development. To offset the tendency to focus on an annual performance cycle, government agencies must focus on the value of developing and maintaining critical organizational knowledge by establishing a long-term commitment to workforce excellence (Kaplan, 2013).

Training Program Evaluation

Kennedy, Chyung, Winiecki, and Brinkerhoff (2013) "defined true training evaluation as that which examined on-the-job relevancy of the instructional content and the results produced by the training" (p. 2). Through feedback, evaluation provides a means for trainers to design and present satisfactory programs that justify their existence. Once created, training programs should be continuously evaluated and periodically revised to remain relevant. Shenge (2014) presented several reasons to evaluate training programs. Those reasons include determining whether the training helps the organization reach its goals and objectives, gathering data to improve training content, and gathering information to decide whether the program should continue. Weak and inefficient

programs should be terminated. Remaining programs should be redesigned and improved to make transfer more likely (Saks & Burke, 2012).

Fry and Hemmer (2012), Kong and Jacobs (2012), Singh (2013), and Tasciogullari, Kiyak, and Cicek (2011) reviewed several approaches and models for training evaluation. Common evaluation models include the experimental/quasi-experimental model, the logic model, the CIPP (context, input, process, product) model, and the Kirkpatrick four-level model. The Kirkpatrick model was chosen for this study due to its flexibility and widespread usage.

The Kirkpatrick model suggests four levels that can be used to evaluate training program effectiveness:

- Level 1: To what degree participants react favorably to the learning event
- Level 2: To what degree participants acquire the intended knowledge, skills, and attitudes based on their participation in the learning event
- Level 3: To what degree participants apply what they learned during training when they are back on the job
- Level 4: To what degree targeted outcomes occur as a result of learning event(s) and subsequent reinforcement (Kirkpatrick & Kirkpatrick, 2013, p. 17).

Levels 1 and 2 can be measured during and immediately following the learning event. Levels 3 and 4 represent learning transfer and are more difficult to measure, given that they require interaction with the participants and supervisors over an extended period. Data to support training program evaluation can be obtained via surveys, interviews,

course critiques, job performance reports, and observation of work tasks (Kennedy et al., 2013; Kirkpatrick & Kirkpatrick, 2013; MacRae & Skinner, 2011; Singh, 2013).

Mandatory training programs, common in government organizations, can be difficult to evaluate. Many of these programs are focused on individual issues and do not always directly link to overall organizational goals and policies as well as the knowledge, skills, and abilities needed to perform the job. Frequently, training recipients see this disconnect and consider the training a waste of time and lose interest. Mandatory programs then become difficult to evaluate due to poor feedback related to this disinterest and perceived irrelevance (Mythen & Gidman, 2011).

Implications

In 2013, 37 % of federal program managers reported that an evaluation had been conducted on their programs within the previous 5 years. Of that group, 80 % stated that those evaluations led to improvements in program performance. Those managers also reported a greater understanding of program performance, value, and effectiveness following the evaluation (U.S. Government Accountability Office [GAO], 2013). Feedback from TQP participants in this study could lead to recommendations for program policy changes, new training course development, and follow-on evaluations. These changes could lead to better performance and safer operations.

Summary

The Department of Energy Technical Qualification Program provides training to personnel who oversee operations at defense nuclear facilities. Those operations involve processes in which mishaps could potentially cause environmental damage and injuries to

workers or to members of the general public. An evaluation was needed to assess training program policies, implementation, and effectiveness. I defined a potential problem with the TQP and created research questions to investigate that problem. Through a literature review, I identified factors that can impact training program effectiveness. Additionally, I presented the Kirkpatrick model for training evaluation as a conceptual framework for the project. In Section 2, I discuss the research methodology, including participant selection, data collection, data analysis, and evaluation findings.

Section 2: The Methodology

Research Design and Approach

The purpose of this study was to gain an understanding of the effectiveness of a government training and qualification program with respect to applicability, performance, and safety from the participant point of view. The research design for this study was a program evaluation using a case study qualitative approach. Kirkpatrick's model for training program evaluation was used as the conceptual framework for data collection.

Qualitative Research Design and Approach

"A program is a set of specific activities designed for an intended purpose with quantifiable goals and objectives" (Lodico, Spaulding, & Voegtle, 2010, p. 317). There are several possible approaches to conducting a program evaluation. The objective-based approach uses objectives written by both the program manager and the evaluator that represent the purpose of the evaluation and the type of data to be collected. An expertise-oriented approach is used by accrediting groups. Accreditors are presented program information and judge the program against established guidelines. During a participatory-oriented evaluation, program participants are directly involved in collecting data and reporting results. The goal-free evaluation approach selected for this study forgoes the use of evaluation objectives. This approach is based on the notion that many findings may fall outside goals and objectives developed by the manager and evaluator. This more flexible path allows for findings and recommendations that may have a significant impact on the program even if not directly tied to program objectives (Spaulding, 2008).

Information from a program evaluation can be used to make changes in the program. Program evaluators can provide two types of feedback. A formative evaluation provides feedback and findings that can be used to address issues while the program is active. A summative evaluation analyzes the results of a program after it has ended and provides feedback on whether the program's objectives and goals were met. This project study will provide formative feedback to TQP managers in the form of a formal PowerPoint presentation (Lapan, Quartaroli, & Riemer, 2012; Lodico et al., 2010; Royse, Thyer, & Padgett, 2010).

This research study used a program evaluation based on a case study qualitative research design. Case study research is appropriate when there is a desire to interpret and understand the experiences of people in a bounded system. A system is bounded when there is a person, group, program, or situation that can be investigated to gain understanding of experiences or views of the members of the system (Lodico et al., 2010; Merriam, 2009).

For this study, information and data were gathered using an instrumented case study design. Data were gathered from program participants to support Kirkpatrick model levels of evaluation. The TQP is not an unusual program; therefore, an intrinsic case study approach was not warranted. An ethnographic qualitative design focusing on unique cultural issues was not applicable because there are no cultural groups associated with the program. Phenomenological qualitative research designs concentrate on unique experiences or events. This approach was also not warranted because no noteworthy events or experiences were anticipated. Finally, given that there is no current desire to

develop a theory associated with the TQP, a grounded theory approach was not suitable (Creswell, 2012).

Participants

Selection of Participants

Information from current TQP participants was essential in order to gain insight on program effectiveness. Purposeful sampling was employed to allow selection of participants who were information rich (i.e., people who could provide significant background information on the study topic). Snowball sampling, a form of purposeful sampling, was also used when initial participants were asked to refer other participants who were deemed information rich (Lodico et al., 2010; Merriam, 2009).

For qualitative research, the intent is to obtain an in-depth understanding of a concept or activity. The desire to report details precludes a large sample size, as the resulting amount of data would be cumbersome and difficult to summarize. For case studies, a small size ranging from four to 10 people is typically used to allow for detailed analysis (Creswell & Plano Clark, 2011). Based on this guidance, eight interviews were conducted for this project study. All interview participants were over 18 years of age, held college degrees, and had 8 or more years of federal employment. Participant experience with the TQP ranged from 6 to over 10 years.

Gaining Access to Participants

Permission to conduct interviews was obtained from the Federal Technical Capability Program Chair (head of TQP) using the letter shown in Appendix D. The local field office manager granted permission following contact via the letter in Appendix

E. The initial interview participant list was generated during a meeting with the local TQP managers. Initial contact with potential interviewees was accomplished via an email invitation with an attached informed consent letter, included in Appendix F. Interested participants responded via email, after which appointments were set to conduct the interviews.

Researcher-Participant Relationship

To create a positive researcher-participant relationship, I established an open, neutral atmosphere based on trust. The initial contact email included a copy of the informed consent letter, which explained the focus of the project, interview procedures, the voluntary nature of the interview, and how participants' privacy would be maintained. I allowed those who elected to participate to select the time and place for the interview. All participants chose to have the interview in their private offices. Those offices were located in controlled areas, which prevented audiotaping; therefore, I deliberately slowed the interview process to allow more meticulous transcription. All participants were informed of their right to withdraw at any time. All agreed to and attended a second meeting to conduct member checks of the transcripts in order to verify that I had captured their thoughts accurately. The average interview length was 60 minutes. Three potential interviewees elected not to participate.

Protection of Participants' Rights

At the initial meeting, I reviewed the contents of the consent letter, verified the individual's intent to participate, and obtained the participant's signature on the consent letter. All participants were informed of their right to withdraw at any time. The

informed consent letter, included in Appendix F, provided information on (a) the objectives of the study, (b) interview format and procedures, (c) the voluntary nature of the study, (d) how privacy and confidentiality of the participants would be protected, and (e) researcher and Walden University contact information. Unique codes known only to me were assigned to each participant and associated documents. Data notes and my personal reflections were kept in a personal journal. All transcripts, computer files, my journal, and other materials associated with study participants have been stored in a locked container. Computer files have been password protected. I will have sole access to participant information and project study materials. Any information that could link participants to their workplace, supervisors, or managers was removed from this report.

Data Collection

Although observations and document reviews are an important part of qualitative research, those forms of data were not available in support of gaining the participant perspective on TQP effectiveness for this study. However, program- and site-level documents were reviewed to gain an understanding of policies and procedures in support of data collection during interviews. Data collection began following Walden University Institutional Review Board approval (IRB # 01-06-16-0330391).

Data associated with evaluation of TQP effectiveness were collected via semistructured interviews. The semistructured interview format allowed the initial set of questions to be supplemented with probing or follow-on questions to gain additional information (Lodico et al., 2010). Kirkpatrick's model was used to develop interview questions with the goal of obtaining data supporting Level 3 (behavior) of the evaluation

model. It was not expected that program participants would be aware of broader Level 4-related training outcomes such as effects on costs and profits, or organizational productivity. Interview questions are included in Appendix G and were field tested on a Kirkpatrick model evaluator, a former TQP participant, and a DOE National Training Center training department manager. The field testers had no connection to the interviewees and had extensive experience conducting interviews and program reviews. Their recommendations were captured in the question listing.

Role of the Researcher

My past employment at the research site should not have caused any bias or conflict of interest in this research study. My last duties at this site occurred over 6 years ago. My capacity in the TQP while in that staff position was purely administrative in nature, and I had no decision-making or policy-making authority. No personnel worked for me during the employment period. My current employment at the DOE National Training Center (NTC) involves database maintenance and curriculum development. I was a classroom instructor until 3 years prior to this study but never taught classes that included any of the study participants. The NTC is a support organization that provides training when requested by other DOE sites. The NTC provides training based on DOE Headquarters guidance and does not originate policy or direction to other DOE organizations.

Data Analysis

For data analysis, I followed steps suggested by Creswell (2012). The major steps involved the following:

1. Transcription of interview notes.
2. Conducting a preliminary review of transcriptions to develop a broad perspective. Following each interview, I verified that interview responses were valid and aligned with the associated research questions.
3. Grouping of interview data into broad categories related to the research questions. This initial grouping was followed by selection of themes related to the data groups. Eventually, codes were assigned to themes to enable easier assignment to notes and transcripts.
4. Discussion of the relationship among research questions, themes, findings, and recommendations. This discussion takes place in the data analysis section of the report.
5. Enhancement of study validity with member checks. All participants reviewed the interview transcripts and provided feedback. Additionally, two peer debriefers reviewed notes, transcripts, themes, and codes. They provided feedback that was used to promote reflection and reduce possible bias (Lodico et al., 2010).

Limitations

This research study was limited to an evaluation of a training program at a single site. The findings of this study are not generalizable to other TQP sites due to the different interpretations and applications of program guidance possible at other locations. Interviews were limited to program participants and did not involve supervisors or managers. Data from a different perspective could provide additional insight related to

program effectiveness. Another limitation to this study was reliance on a single data type, interviews, to evaluate program effectiveness. Additional data types would allow for data validation via triangulation (Lodico et al., 2010). Finally, the quality of this evaluation was dependent on my skills, perceptions, and experience level.

Data Analysis Results

This project involved evaluation of a training and qualification program at a DOE field office. The evaluation focused on gathering participant perspectives on program effectiveness. Data from interview questions associated with four research questions were analyzed to evaluate the program. The research questions were as follows:

1. What is the perceived effectiveness of the Department of Energy Technical Qualification Program among its participants?
2. What is the perceived applicability of the Department of Energy Technical Qualification Program among its participants?
3. How did the training program impact behavior or performance on the job?
4. How do participants describe the impact of the training program on safety?

The following major themes were derived from interview data:

- Agency training program design and management
- Site training program implementation and management
- Training program to duty correlation
- Job performance
- Training program support

Table 1 lists broad categories of data supporting the major themes.

Table 1

Project Data Themes

Major themes with supporting information
Agency TQP design/management - Functional Area Qualification Standard (FAQS) management (design, content) - Requalification - Continuing training guidance - Equivalence (certifications, experience)
Site TQP implementation/management - FAQS assignment vs. background - Local requalification (vs. continuing training) - Equivalence (certifications, experience) - Program support (manager/supervisor/peer, resources—time/travel/etc.)
TQP to duty correlation - FAQS to duty match - Outdated FAQSs - Educational background
Job performance - Oversight training - Impact on oversight/safety - Career enhancement/incentives - Educational background
TQP training support - NTC course correlation to FAQSs - NTC course correlation to job duties - Training crosswalks (to courses, to other agencies, to FAQSs) - Oversight training

Research Question 1

Research Question 1 (RQ1) was as follows: What is the perceived effectiveness of the Department of Energy Technical Qualification Program among its participants?

Interview Questions 1 through 12 from Appendix G were conceived to gather data for RQ1. Themes derived from responses included agency training program design and management, site training program implementation, and training program support.

Finding 1: The TQP is not effective in preparing program participants for their jobs. Six of eight study participants felt that the TQP was ineffective in preparing them for their jobs.

Participant P2 stated,

> The qualification standard covers material I learned in college years ago, not what I currently do in my job.

Participant P3 stated,

> The TQP does not support my overall professional development. I could study on my own without the TQP and do my job.

Participant P4 stated,

> I received the majority of my job related knowledge from the contractor, not the TQP.

Participant P5 stated,

> My professional certification provided the knowledge necessary to perform my job, not the TQP.

Six study participants rated organizational support for the TQP as high. The two remaining participants rated that support as medium to high. Supervisory support for the TQP was rated as high by four participants, medium to high by three participants, and low by one participant.

Participant P1 stated,

> Organizational support is high. Subject matter experts are helpful, willing, excited, and available. The site manager supports the program very well and makes it a priority. My supervisor fully supports, gives clear expectations, and allows sufficient time to study.

Participant P4 stated,

> Organizational support is high. Management is interested and ensures that everyone is qualified.

In contrast, six of eight participants stated that peer support for the TQP was low, with the remaining two participants rating peer support as medium.

Participant P2 stated,

> In my immediate group of about five coworkers, they wonder why they need to do the qualification in the process in which they are done. It is a waste of time.

Participant P3 stated,

> I have about seven coworkers. In general, they feel TQP is a "check in the box" exercise. They do it because they have to and get little from the effort.

Participant P8 stated,

> There are mixed feelings. One coworker thought it was good to go through the program. Another just finished a requalification and thought it was not beneficial. No one is a big fan of requalification. The requalification covers the exact same material as the initial qualification. It would be more beneficial if a continuing training program replaced the requalification requirement.

Finding 2: Additional training support for the TQP is needed for program participants. Although program participants reported that sufficient time and funding was available to attend training courses to support their work needs, training courses associated with the TQP were limited, not available, or not utilized.

Participant P1 stated,

> I would like to see some nuclear engineering, material science, and corrosion control related courses. I found useful material at two university sites. It would be nice if the NTC could provide that kind of material instead of having to find it on my own. I did not receive federal oversight training as part of my TQP qualifications.

Participant P2 stated,

> I did not receive any oversight training as part of the TQP. The periodic (three-year) requalification is not DOE order driven. Continuing education (training) is a better path. The requalification is a repeat of the previous qualification, supposedly a refresher. I did not feel refreshed, only relieved that it was done.

Participant P3 stated,

> I attended some helpful security courses from the NTC. The safety related courses need improvement. They just repeated the contents of headquarters documents. I did not received oversight training as part of the TQP.

Participant P4 stated,

> I took a few nuclear safety courses from the NTC, but I got nothing out of them. I do not intend to take any more. They did not provide anything I could not get by

reading documents on my own. I received oversight training through mentoring during my qualification but not formally from the TQP.

Participant P5 stated,

There are no NTC courses related to my TQP functional area. I wish the NTC would crosswalk the TQP qualifications to courses to make it easier to qualify. TQP has always failed in this. Specifically, list which competencies are covered by specific courses. In my case, maybe the NTC could find outside agency courses and establish reciprocal training agreements. I received oversight and governance training as part of other DOE initiatives, not as part of the TQP.

Participant P6 stated,

I took two courses helpful for my functional area qualification. I plan to take a couple of oversight courses later this year for continuing training. I did not take any oversight courses in the past as part of the TQP.

Participants P7 stated,

I did not take any oversight courses as part of the TQP. A training course on interacting with the contractor (oversight and management) would be very useful.

Participant P8 stated,

I did not take any oversight courses as part of the TQP. No one is a big fan of requalification. The requalification covers the exact same material as the initial qualification. It would be more beneficial if a continuing training program replaced the requalification requirement.

In summary, six of eight study participants felt that the TQP alone was ineffective in preparing them to perform their jobs. Organizational and supervisory support was generally high, but peer support was low. Participants commented that a managed continuing training program associated with the TQP would help maintain knowledge levels and eliminate periodic requalification to the original, unchanged qualification standard. Additional training courses covering qualification standard competency requirements, contract management and oversight, and other technical topics were also desired.

Research Question 2

Research Question 2 (RQ2) was as follows: What is the perceived applicability of the Department of Energy Technical Qualification Program among its participants? Interview Questions 13 through 20 from Appendix G were conceived to gather data for RQ2. Themes derived from responses included agency training program design and management, site training program implementation, TQP to duty correlation, and training program support.

Finding 3: DOE Functional Area Qualification Standards (FAQSs) do not match TQP participant knowledge, skill, and ability requirements. TQP participants are directed to complete an FAQS related to their assigned contract oversight area. Each FAQS identifies technical competencies common to all defense nuclear facilities for the selected functional area. The competency requirements define the knowledge, skills, abilities required of each program participant.

Table 2 lists the percentages reported by study participants of how well assigned FAQSs competencies aligned with actual job requirements. The alignment match varied from a low of 10 % to a high of 95 %.

Table 2

Functional Area Qualification Standard Alignment to Job Requirements

Participant	Alignment match
P1	80%
P2	10 to 20%
P3*	20 to 80%
P4*	20%
P5	65%
P6	70%
P7	5 to 10%
P8*	80 to 95%

* indicates a match range when multiple qualifications were completed.

Participant P1 stated,

> I am working with headquarters on my FAQS to make it more closely match private industry standards. The current match is about 80 %.

Participant P2 stated,

> About 10 to 20 % of my assigned qualification standard matches my actual job requirements. The rest of the material is nice to know but is not useful for my

job. Other people have responsibilities in those areas. The qualification standard would be more helpful if it was tailored more to my job.

Participant P3 stated,

For each job, the Field Office should analyze what the job actually entails and tailor the qualification more to the job. More emphasis should be placed on the site-specific level and less on the first two levels since they are kind of general and do not provide any application to what you are doing on the job.

Participant P4 stated,

The FAQS is basic; i.e., not specific enough. Less than 20 % of my assigned FAQS matched my actual job requirements. The TQP does almost nothing for my functional duty area.

Participant P7 stated,

My FAQS to duty match is 5 to 10 % because a very small number of the systems covered by the qualification standard exist at my assigned facility.

Finding 4: Insufficient TQP credit is given to program participants for prior education, experience, and industry certifications.

Participant P1 stated,

I was told that credit would be given for my industry certification but ultimately I was not. Instead, I was required to complete a separate, parallel, broad content qualification very similar to my already completed industrial certification. The TQP does not have an effective continuing training program like some private industries. In order to maintain my industry certification, I must gain points from

periodic training and submit those records to retain the certification. This training should get credit in the DOE.

Participant P3 stated,

The program needs to give more weight to past experience and education. For each job, the Field Office should analyze what the job actually entails and tailor the qualification more to the job. More emphasis should be placed on the site-specific level and less on the first two levels since they are kind of general and do not provide any application to what you are doing on the job.

Participant P4 stated,

The equivalency process is lacking. I felt penalized for not getting credit for my degree and previous experience. The TQP makes it so hard to get an equivalency that it is easier to repeat the content and competency requirement. Industrial organizations have standards and certifications. An industrial certification like Radiation Health Physicist or Industrial Hygiene should count for the FAQS so that all that is required is the site-specific qualification requirement.

Participant P5 stated,

The federal government recognizes my industrial certification but the TQP does not. My FAQS evens says to do so. There is a fear in granting equivalency even though it is allowed in the FAQS. I was denied those allowed equivalencies at two different TQP sites. I was told that it required too much paperwork and they did not want to be held responsible.

Participant P6 stated,

> I dislike requalification. I do not think that the TQP gives enough credit for past experience and outside professional certification. For example, Radiation Protection, Industrial Hygiene, Fire Protection, and Occupational Safety are areas where industry certifications exist that are also in the TQP. I know there is a process in TQP for granting credit but it is not done as much as it could be.

In summary, the study participants felt that the TQP had low applicability to their actual job requirements.

Research Question 3

Research Question 3 (RQ3) was as follows: How did the training program impact behavior or performance on the job? Interview Questions 21 through 28 from Appendix G were conceived to gather data for RQ3. Themes derived from responses included site TQP implementation and job performance.

Finding 5: Participation in the TQP did not always improve job performance. Three of eight study participants reported a positive change in job performance due to participation in the TQP.

Participant P1 stated,

> The TQP exposed me to areas not previously encountered. I feel more productive and engaged. I can ask smarter, better questions.

Participant P6 stated,

> Yes, I think the qualification made me review elements important to my job. It gave me a higher level, broad perspective; a bigger picture.

Participant P8 stated,

Yes, the qualification helped me perform better once I started the job.

The remaining study participants stated that there was no effect on job performance or confidence level due to participation in the TQP.

Participant P4 stated,

> I received the majority of my job related knowledge from the contractor, not the TQP.

Participant P5 stated,

> My professional certification provided the knowledge necessary to perform my job, not the TQP.

In summary, the study participants felt that the TQP did not have a significant effect on job performance or behavior.

Research Question 4

Research Question 4 (RQ4) was as follows: How do participants describe the impact of the training program on safety? Interview Questions 29 through 31 from Appendix G were conceived to gather data for RQ4. Themes derived from responses included site TQP implementation and job performance. TQP participants conduct oversight of activities at assigned facilities but do not actually perform any hands-on actions.

Finding 6: The TQP has a positive impact on safety. Only one of eight study participants stated the TQP did not have an impact on safety.

Participant P5 stated,

The TQP did not have an impact on safety related oversight. My professional certification and work experience gave me the background that affected my safety related oversight duties.

Participant P1 stated,

Yes, I recently discovered hazards at a facility based on knowledge gained from the TQP.

Participant P4 stated,

Yes. Knowledge gained from my facility and site-specific qualifications allowed better oversight based on increased familiarity of corporate safety requirements.

Participant P6 stated,

Yes it does. Through the TQP qualification process, I became more aware of hazards and associated controls for them.

Participant P7 stated,

Yes, I became more aware of small hazards that are usually missed.

Participant P8 stated,

Yes, definitely. I obtained a better understanding of safety policies and how the contractor should implement them.

In summary, the study participants felt that the TQP had a positive impact on safety in their jobs.

A list of findings generated from data analysis follows:

1. The TQP is not effective in preparing participants for their jobs.
2. Additional training support for the TQP is needed for program participants.

3. DOE Functional Area Qualification Standards (FAQSs) do not match TQP participant knowledge, skill, and ability requirements.
4. Insufficient TQP credit is given to program participants for prior education, experience, and industry certifications.
5. Participation in the TQP did not always improve job performance.
6. The TQP has a positive impact on safety.

Conclusion

The TQP appeared to be well managed and supported at the site. Other than complaints about the local three-year requalification requirement there were few negative remarks concerning site-controlled aspects of the program. A review of program history coupled with interview responses suggests that after creation and implementation of the TQP in the mid to late 1990s, the program lapsed into a maintenance mode during which little or no program wide assessment or change took place. Kezar and Lester (2009) wrote that it is common to find differences between an organization's specified mission described in mission statements and the portrayed mission demonstrated by actual processes and activities. Periodic program assessments can minimize the difference between specified intentions and demonstrated performance of the program (Dickeson, 2010).

Section two of this proposal described the selected research design, a qualitative case study. Factors associated with study participants such as selection, protection, confidentiality, sample size, and access were discussed in detail. Data collection analysis steps were outlined followed by research study limitations. Next, data analysis results

were presented. Major themes were listed followed by findings based on the interview data. Statements from study participants were included in support of the findings.

Section 3: The Project

Introduction

The DOE TQP originated in the mid-1990s in response to concerns about development and retention of employees with expertise in nuclear-weapons-related fields. The purpose of this study was to gain an understanding of the effectiveness of this training program with respect to applicability, performance, and impact on safety from the program participant point of view. A possible outcome of a program evaluation is a findings-based list of recommendations for program improvement. Franklin and Blankenburger (2016) contended that conducting a program evaluation that does not include program improvement as a possible outcome wastes resources and becomes a chore performed to minimum standards to achieve credit for completing the assigned evaluation task.

Rationale

I chose a program evaluation as the genre for this project due to the lack of data related to the effectiveness of the TQP. A thorough review of program-related documents showed no evidence that the TQP had ever been assessed, reviewed, or evaluated for effectiveness since its origin over 20 years ago. The other possible genre outputs, namely a curriculum plan, a professional development plan, or a policy recommendation, could have been useful but were too narrow in scope to address program-wide issues. The program evaluation output or evaluation report presents the purpose, criteria, and findings as well as recommendations for addressing the findings.

Those recommendations could lead to program-wide improvements, thereby increasing the value and impact of the program.

Review of the Literature

The literature review for this section of the project report focused on topics related to the collected data, associated findings, and related recommendations. Relevant sources were retrieved from government websites, the Walden University online library, and appropriate textbooks. Search terms included variants of *training program evaluation*, *program assessment*, *program certification*, *accreditation*, *industrial certification*, *professional certification*, *job-task analysis*, *job analysis*, *continuing training*, and *continuing education*. Saturation was reached when search terms returned the same sources and when remaining sources were deemed irrelevant to the study.

Training Program Evaluation

"Training is one of the most important interventions in the performance improvement toolkit to help improve organizational performance, to impart new knowledge to employees, and continuously update their knowledge, skills, and behaviors in the workplace" (Williams & Nafukho, 2015, p. 69). Those issues, coupled with the high cost of training program maintenance (e.g., over $125 billion for U.S. organizations in 2009), necessitate training program evaluation (Farrington, 2011). A program evaluation is a study or investigation aimed at collecting data for use in determining how well a program is functioning and whether changes are warranted (Chyung, 2015; U.S. GAO, 2012). Kennedy et al., (2013) added that a true training evaluation verifies that training content matches and supports on-the-job performance requirements. This

verification correlates with Level 3 of Kirkpatrick's training evaluation model, the chosen conceptual framework for this project study.

Franklin and Blankenburger (2016) identified the involvement of stakeholders as an important item when conducting a program evaluation. Evaluation findings can help these stakeholders gain a better understanding of the program, change their perceptions of the program, and prime their desire to make changes to the program (Adams, Nnawulezi, & Vandenberg, 2015). *Upstream stakeholders* take part in the design and implementation of the program. *Downstream stakeholders* include program participants and anyone who could be affected by consequences of the program. Downstream stakeholders for the TQP include DOE employees, facility workers, and the general public. Stakeholders can provide information concerning the condition and worth of a program during an evaluation (Chyung, 2015).

This program evaluation had a formative design, in that it examined a program while it was in progress. Formative evaluations provide data useful for modifying a program to increase its effectiveness. Gathering data from program participants is vital. Participant perceptions help in determining whether program objectives are being met and can be the basis for future planning (Curado & Teixeira, 2014; Shakman & Rodriguez, 2015).

Recommendation: Conduct a top-to-bottom review of the TQP. Based on study participant statements, the applicability and therefore the value of the TQP are in question. Consequently, a comprehensive review of the program is warranted. Dickeson (2010) presented 10 criteria for use in reviewing and prioritizing academic programs and

services. Those criteria can easily be adapted to support a TQP review. Criterion 1 focuses on the history and mission of the program. Is it possible that the conditions that led to creation of the program no longer exist or have changed sufficiently to warrant major program modifications? In short, is the TQP still needed? Criterion 4 concentrates on program inputs and processes. Determinations are made on the quality of curricula and other supporting documentation such as qualification standards. Criterion 9 measures the impact of the program. Does the program contribute to the DOE mission? Is the program related to other DOE programs? If so, could similar programs be merged? Finally, criterion 10 looks to the future of the program. Should the program be modified to support anticipated mission changes? Is there an opportunity for collaboration with other programs or institutions with similar missions?

Job Analysis

Project study finding 3 states that the FAQSs do not match TQP participant knowledge, skill, and ability requirements needed on the job. Diamantidis and Chatzoglou (2014) wrote that in order to maximize learning transfer, training content must match the knowledge, skills, and abilities required on the job to the highest extent possible. A job-task analysis is possibly the most important phase of training program design. The following steps are recommended to conduct a job-task analysis:

1. Utilize subject matter experts to create a list of job tasks and activities.
2. Develop a survey questionnaire based on the job task list.

3. Distribute the survey and request that respondents rate each task based on difficulty, frequency, and importance for job performance (Koby & Melby, 2013; Larsen & Aisbett, 2012; Wang & Stahl, 2012,).

Recommendations.

1. Conduct a job analysis for all TQP functional areas at the site and use the analysis as a basis to update qualification standards and supporting training course content.
2. Require that all TQP participants receive formal oversight training. Oversight is the primary duty for all personnel in the TQP.

Professional Certification

The Institute for Credentialing Excellence defines *certification* as a program "designed to test the knowledge, skills, and abilities required to perform a particular job, and, upon successfully passing a certification exam, to represent a declaration of a particular individual's professional competence" (Novak, Parent-Johnson, Owens, & Keul, 2014, p. 100). External certifications are considered portable because they are not defined by a single job at a specific agency. An external certification serves as an impartial acknowledgement of a person's professional, industry-wide knowledge and experience (Mulvaney, Beggs, Elkins, & Hurd, 2015). Certification increases consistency of performance, increases credibility, promotes ethical behavior, and enhances marketability (Shackman, 2015). All DOE FAQSs allow the use of professional certification as a means of demonstrating competency through an equivalency process when applicable. However, study participants stated that the

equivalency process is rarely used. One participant added that a completed qualification in the TQP is not recognized or meaningful outside of the DOE.

Recommendation: Encourage or require more use of industry/professional certification in the TQP. In some areas, such as industrial hygiene, fire protection, or radiation protection, the completion of a professional certification could replace the FAQS requirement, as long as DOE-specific competencies are shifted to the site-specific qualification standard. This initiative would save time and reduce redundancy.

Continuing Training

Advancements in technology require changes in work practices. Through continuing education and training, workers can remain current, be adaptable, and perform at higher levels (Arnold, Goodson, & Duarte, 2015; Choy, Billett, & Kelly, 2013). McMillan, McConnell, and Sullivan (2016) added that continuing professional development ensures that the workforce is capable of performing its mission. All FAQSs contain an appendix that encourages continuing education following completion of the qualification standard. Some offer specific recommendations such as training courses related to the functional area, but the majority recommend activities such as actively performing assigned duties or attending meetings or seminars related to the functional area. Four FAQSs contain a 5-year requalification requirement that involves repeating part or all of the FAQS. If the FAQS has not been revised, the participant repeats the same, possibly outdated competency requirement. One study participant reported having completed the same FAQS three times. Several participants expressed the desire to replace the requalification requirement with a continuing education program.

Recommendation: Create a structured, monitored continuing training and education program for all TQP participants. Eliminate the local requalification requirement.

Partnering and Collaboration

Kezar and Lester (2009) wrote that collaboration provides better service, promotes learning, creates innovation, increases efficiency, and reduces costs. They described two types of collaboration—internal and external. Internal DOE collaboration could involve interactions between other DOE offices and their associated training organizations. External collaboration could involve partnerships with other federal agencies, universities, research laboratories that work with the DOE, and industries that share common job tasks. Interview data revealed several possibilities for collaboration between TQP management and other groups regarding training course support and professional certification.

The DOE Project Management Career Development Program (PMCDP) was created in 2001 following a Congressional mandate to ensure that the DOE has qualified and experienced project directors. This certification program provides directors with the knowledge, skills, and abilities needed to oversee projects such as major construction and environmental cleanup (Project Management Career Development Program, n.d.). The PMCDP was modeled after the TQP, which was implemented several years prior. A review of PMCDP guidelines revealed well-defined requirements for certification, equivalency, curriculum support, and experience. Outside certifications such as Project Management Professional, Professional Engineer, and Registered Architect are given

direct credit toward PMCDP certification. This program collaborates with the Defense Acquisition University, an institution that provides direct support to the Department of Defense, for training curricula (U.S. DOE, 2015).

Recommendations.

1. Explore an internal collaboration with the PMCDP office. A review of PMCDP documents shows similar functions and processes. Investigate other DOE program offices for training programs with similar requirements.
2. Explore external collaboration with other agencies such as the Department of Defense, the Nuclear Regulatory Commission, and related professional certification organizations. Personnel at those organizations receive the same or similar training as many DOE TQP personnel. Sharing training resources could benefit all partners.
3. Explore partnerships with co-located universities. Those universities with engineering departments are a potential source of employees, subject matter expertise, and research support.

Program Accreditation

Two project interview participants stated that their TQP was accredited but did not know what that meant. McDavid and Huse (2015) defined *accreditation* as a method by which a program is assessed by an outside group against established standards. Accreditation indicates that a program has met a predefined level of quality and that participants received education and training to support attainment of expected knowledge, skills, and abilities. Benefits of program accreditation include credibility,

accountability, reliability, and validity. Institutions with accredited programs tend to employ continuous process improvement methods to maintain program quality (Ramsay, Sowell, & Hartz, 2015). Site TQP accreditation would support the DOE intent to prepare participants to perform with the desired professional competency, increase program quality, and promote program change when needed (Garrison, Herrington, & Hinton, 2013). Site TQP accreditation is optional, and only 3 of 25 sites have chosen to pursue this level of evaluation.

Recommendation: Maintain site TQP accreditation and inform stakeholders of the benefits.

A summary listing of recommendations follows:

1. Conduct a top-to-bottom review of the TQP.
2. Conduct a job analysis for all site TQP functional areas, and use the analysis as a basis to update qualification standards and supporting training course content.
3. Require that all TQP participants receive formal oversight training.
4. Encourage or require more use of industry/professional certification in the TQP.
5. Create a structured, monitored continuing training and education program for all TQP participants. Eliminate or make the local requalification requirement optional.
6. Explore an internal collaboration with the DOE Project Management Career Development Program Office.

7. Explore external collaboration with other agencies, such as the Department of Defense, the Nuclear Regulatory Commission, and related professional certification organizations.
8. Explore partnerships with co-located universities.
9. Maintain site TQP accreditation and inform stakeholders of the benefits.

Project Description

Resources and Support

This project was a program evaluation of a training and qualification program at a DOE field office. The program chair and the field office manager fully supported the project and allowed access to participants for interviews. Participants who volunteered for interviews were open and thoughtful in their responses and provided valuable data for analysis. Support for member checks was received from a former program participant and a DOE training center department manager. Both were very familiar with the TQP and provided useful feedback during data review and theme development. The program website provided access to policies, records, and history that were valuable in formulating interview questions, findings, and recommendations. Technological resources required for this project included computer hardware and software for data documentation and storage. Additional resources were not required.

Potential Barriers and Solutions

Potential barriers to project completion included access to potential program participants, access to the field office site, and exposure to controlled information. Field office management immediately granted access to program participants by providing a

roster with contact information. The Walden University Institutional Review Board approved the use of my DOE email address instead of my private Walden University email account based on a request by field office management. This request was based on a recent DOE requirement to minimize or eliminate the use of nongovernment email accounts and servers to discuss work-related issues. All study participants chose to conduct interviews in their work areas, where the potential for exposure to controlled information existed. I was granted access and escorted when required. The unclassified nature and intent of the project were discussed with the program chair and site management personnel prior to project commencement, and with participants while obtaining interview consent. No controlled information was encountered during the project.

Implementation

Implementation of recommendations from this project evaluation is complicated by the eventual requirement to extend program changes to over 25 remote sites. A top-to-bottom review (recommendation 1) would require six to nine months to allow input and review from multiple stakeholders including the safety board that submitted the initial recommendation that led to program creation. If the TQP is retained, a timetable for additional recommendations and associated changes would be developed as an output of the top-to-bottom review. Actions required following the job analysis (recommendation 2) could be extensive due to the subsequent need to revise multiple qualification standards. A qualification standard revision can take up to two years to

complete. Creation of a structured continuing training and education program (recommendation 5) would occur during qualification standard revision.

Mandatory oversight training for program participants (recommendation 3) could begin immediately. A new oversight curriculum is available at the DOE National Training Center. Increased use of professional certification credentials to satisfy competency requirements (recommendation 4) would require creation of a certification-to-competency crosswalk for each related qualification standard and could be accomplished during qualification standard revision. A timetable for exploring and initiating partnerships and collaborations (recommendations 6, 7, and 8) would be flexible, but the process could start immediately. A list of potential partners could be generated and prioritized within two to three months. Staff training on the benefits of accreditation (recommendation 9) could be accomplished immediately.

Roles and Responsibilities of Student and Others

My responsibility as the researcher is to present the results of the program evaluation to the TQP chair, and if directed, to other program stakeholders. I could provide additional background, ideas, and information as requested. The responsibility for putting recommendations into action would fall to the program chair and the Federal Technical Capability Panel members.

Project Implications

In their roles of administration, governance, and oversight, TQP participants act as stewards in the defense nuclear industry. Program participants oversee complicated, hazardous operations in which shortfalls in performance could result in harm to workers,

the public, and the environment. Should this project result in improvements to the TQP, local stakeholders will benefit from program participants with higher levels of competence and performance, which can lead to safer facility operations. Safe operation of defense nuclear facilities is the goal of the DOE and the TQP. Improvements to this training and qualification program could lead to a lower probability of harm to workers, the public, and the environment near the research site.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

A program evaluation adds value to the program under review by providing feedback from which changes and improvements can result (Posavac, 2011). The program evaluation conducted for this project study showed that the TQP has areas in need of additional review and attention. Use of a qualitative case study design allowed the gathering of data to support an understanding of participant perceptions of the program.

A limitation of this study was reliance on a single data type (i.e., participant interviews) to evaluate program effectiveness. Additional data types such as feedback forms and interviews of other program stakeholders could have added depth to the evaluation. Another limitation of this study was that the evaluation focused on one of 25 TQP sites. Each site has a unique program, and findings and recommendations based on a single site evaluation might not be applicable or generalizable to other sites. This evaluation focused on Level 3 of Kirkpatrick's four-level training evaluation model. A more effective evaluation would involve all four levels. Finally, the success of the program evaluation is based on acceptance and implementation of several recommendations. Implementation would require a significant, long-term commitment from stakeholders, possibly limiting the impact of the evaluation.

Recommendations for Alternative Approaches

Involving additional stakeholders and multiple TQP sites would allow a broad, more in-depth evaluation of the program. A mixed-method research approach composed

of a quantitative-qualitative research sequence could provide an alternative research path toward a better program evaluation. Creswell and Plano Clark (2011) suggested that combining quantitative and qualitative methods can provide a better understanding of the research problem and associated research questions than either method alone. Mixed methods research takes advantage of the strengths of both qualitative and quantitative data. Quantitative methods provide data that can show comparisons, trends, frequency, probabilities, and other statistical information. Qualitative data such as interviews and observations provide perspectives, opinions, and reflection.

A survey questionnaire could be sent to multiple stakeholder types at multiple TQP sites to gather initial data. The structure of the follow-on qualitative phase would be based on quantitative data findings. Interviews of supervisors, program participants, and other related stakeholders could take place at multiple sites along with document reviews at those sites. Data validation would be possible via triangulation. This wider sampling would be more indicative of the overall state of the training program and could result in generalizable findings and recommendations.

Issues associated with TQP effectiveness may not be based on site-level implementation. An alternative problem definition could point to a higher level. An example of another problem statement is the following: A lack of sufficient guidance and oversight of the TQP by the Federal Technical Capability Panel has resulted in a wide variance in the quality and effectiveness of site programs. The underlying issue would still be a lack of past program evaluation, but the focus would be shifted to agency mission accomplishment, policy creation, and program implementation from the top vice

program performance at the site level. This evaluation would require involvement of higher level stakeholders as well as multiple site-level stakeholders, resulting in a completely different perspective of program effectiveness.

Scholarship, Project Development and Evaluation, and Leadership and Change

Scholarship

My journey during this doctoral program has exposed me to a new world of research, reflection, discussion, and learning. My background is in engineering, and after 26 years in the U.S. Navy, it has been an interesting transition from a world where most issues are answered with "yes," "no," or a number. This new path has required a significant, positive adjustment in reading, interpretation, and writing style. I have gained a new interest in and appreciation of research. My attention is immediately captured when I read about or hear of research efforts in the print and broadcast media. I wonder about the research method, the research population, the motivation behind the research, and other issues. I can point to possible bias as well as social impact based on concepts learned at Walden. I started this program solely for personal enrichment, and it has been extremely challenging and worthwhile.

Project Development

Naujokaitiene (2013) wrote that project developers have three distinct action areas: planning, implementation, and reporting. I learned that planning consists of project definition, resource and role identification, determination of objectives, and action plan development. Project implementation involves action plan initiation. During this

phase, I gathered and analyzed data, from which findings and recommendations were generated. The final area, reporting, consisted of creating an evaluation report, which is included in Appendix A. The evaluation report developed for stakeholders summarized all project areas. Project development is a lengthy process requiring assistance from stakeholders and subject matter experts. Prior to future projects, I will review and reflect on my path through this project and hope to benefit from lessons learned.

Leadership and Change

Once the need for change is recognized, leaders, administrators, and stakeholders must have the willingness and courage to initiate and complete the transformation. Leaders who are committed to change will expend political capital and strain working relationships during the process (Dickeson, 2010). Changes to the TQP will require collaboration between four major DOE program offices that have distinctly different missions. Due to those differing missions, the program offices and associated sites occasionally have divergent interpretations and implementation paths for some aspects of the TQP. Collaborative leadership involving trust, communication, and shared goals is vital to institutional transformation (Eckel & Kezar, 2003).

Reflection on Importance of the Work

Although federal agencies are immune to profit-driven activities and requirements, the American public expects that government entities will operate in a fashion that is efficient and effective. To that end, it was unexpected to find that the TQP had not been formally evaluated during over 20 years of operation. The program is relatively small, with approximately 1,200 participants, but its impact is potentially far

reaching due to its relationship to the U.S. nuclear weapons complex. I believe that this project is important, as it is a small first step in evaluating the TQP. The findings and associated recommendations can lead to an improved training and qualification program that operates more efficiently and effectively.

Implications, Applications, and Directions for Future Research

Potential Social Impact

Worker and environmental protection efforts are extremely important, as evidenced by the existence of two federal agencies dedicated to those causes. The Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) were created to provide guidance and oversight in their respective areas. The DOE is required to develop and follow policies that meet the regulations set forth by OSHA and the EPA.

TQP participants are charged with oversight of operations at defense nuclear facilities. Proper oversight could lead to fewer injuries to workers and reduce the possibility of hazardous material release to the environment. Reduced personnel injuries would lower the impact on families due to loss of income by an incapacitated worker. Less support from the healthcare system would be required, allowing those resources to be used elsewhere. The worker's organization would not be required to reassign duties to other workers or hire a replacement. Environmental cleanup is a high-cost and lengthy process. Some contaminated areas can never be released to the public due the extent and longevity of the hazard. This eventuality can render valuable, useful property unavailable

for public use. It is prudent and socially responsible to make all reasonable efforts to reduce the possibility of worker injury or hazardous material release to the environment.

Future Research

As discussed previously, I recommend additional research in the form of a TQP evaluation using a mixed-method design. The first phase would utilize a quantitative survey of multiple TQP sites. The second phase would have a qualitative case study design based on the findings from phase 1. The findings from both phases would then be merged and interpreted to provide a better measure of TQP effectiveness as well as enhanced recommendations for improvement.

Conclusion

The purpose of this study was to determine the effectiveness of a DOE training and qualification program from the participant point of view. Interview data resulted in findings that the program contributes to a safer work environment but that changes to program management and implementation are warranted. Change recommendations include performing a top-to-bottom program evaluation involving all stakeholders, a job analysis, additional training support in the form of additional training courses and a continuing training program, and increased collaboration between the site and other organizations with similar training and qualification requirements. The results of this study may help site training officials improve program effectiveness and worker performance. These improvements may result in safer operations at this DOE facility, which in turn may lead to fewer injuries to workers and a reduced probability of release of hazardous materials to the environment.

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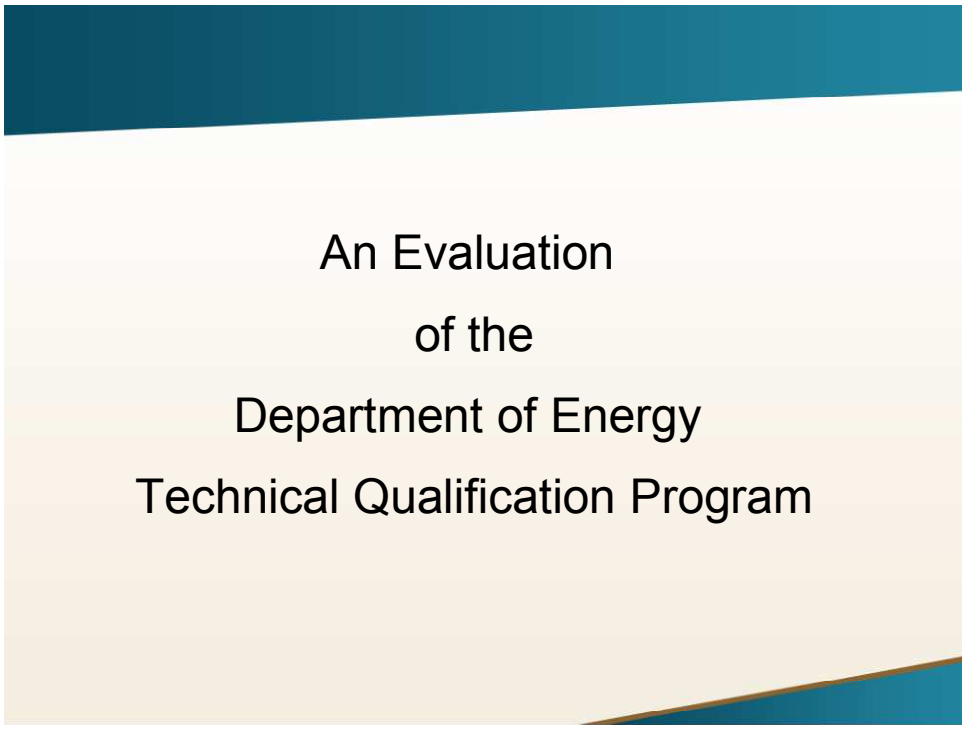
Appendix A: Project Evaluation

A PowerPoint presentation was selected as the template for this deliverable because it is the presentation format of choice for the DOE and TQP stakeholders.



Agenda

- Introduction
- Problem
- Rationale
- Methodology
- Findings
- Recommendations
- Discussion

Introduction

A primary goal of the Department of Energy (DOE) is to develop and maintain a highly capable and flexible federal workforce that can execute the mission in a safe, secure, efficient, and sustainable manner.

DOE Strategic Plan, 2014

Introduction

DNFSB Recommendation 93-3

- Expressed concerns regarding declining DOE expertise in the defense nuclear facility arena
- Resulted in the creation of the TQP

Purpose

- The purpose of this evaluation was to gain an understanding of the effectiveness of the DOE Technical Qualification Program with respect to applicability, performance, and safety from the participant point of view.

The Problem

- The TQP has never been evaluated for effectiveness
- No evidence that TQP participants perceive the program meets their needs on the job

Rationale

Evidence of the problem

- Improper oversight can result in negative consequences to workers and society
- Incidents at defense nuclear facilities
- Accident investigations listed shortcomings in oversight as contributing factors to the incidents. Oversight is the primary duty of TQP participants.
- Informal feedback from program participants

Significance of the Study

- Improvements to the TQP could lead to better oversight and fewer incidents.
- Fewer incidents could result in a lower probability of worker injury.
- Fewer incidents could result in a lower probability of hazardous material release to the environment.

Research Questions

1. What is the perceived effectiveness of the Department of Energy Technical Qualification Program among its participants?
2. What is the perceived applicability of the Department of Energy Technical Qualification Program among its participants?
3. How did the training program impact behavior or performance on the job?
4. How do participants describe the impact of the training program on safety?

Literature Review

- Workforce Development
- Training Needs Assessment
- Learning Transfer
- Kirkpatrick's Training Evaluation Model
- Job-Task Analysis
- Professional / Industrial Certification
- Continuing Training
- Partnering and Collaboration
- Program Accreditation

Kirkpatrick's Training Evaluation Model

- Level 1 – To what degree participants react favorably to the learning event
- Level 2 – To what degree participants acquire the intended knowledge, skills, and attitudes based on their participation in the learning event
- Level 3 – To what degree participants apply what they learned during training when they are back on the job
- Level 4 – To what degree targeted outcomes occur as a result of learning event(s) and subsequent reinforcement

(Kirkpatrick & Kirkpatrick, 2013, p. 17).

Methodology – Evaluation Type

- Qualitative Program Evaluation based on Level 3 of Kirkpatrick's model
- Focused on participant perception of program effectiveness
- Project limited to single site

Methodology – Participant Selection

- Eight TQP participants interviewed
- Purposeful selection used to obtain experienced participants
- Voluntary participation
- Confidentiality of participants

Data Collection

Interview areas based on research questions

- Program effectiveness
- Program applicability to position
- Program impact on behavior
- Program impact on safety

Data Analysis

- Interview transcription reviewed by participants for accuracy
- Related transcription contents grouped and coded
- Themes developed from common groups
  - TQP design and management
  - Site TQP implementation and management
  - TQP to duty correlation
  - Job performance
  - TQP training support

Research Question Answers

Overall, TQP participants felt

- The TQP was ineffective in preparing them for their jobs.
- Applicability of the qualification requirements was low.
- The TQP did not improve job performance.
- The TQP had a positive impact on safety.

Findings

1. The majority of participants felt the TQP was ineffective.
2. Additional training support for the TQP is needed for program participants.
3. DOE Functional Area Qualification Standards (FAQSs) do not match TQP participant knowledge, skill, and ability requirements.
4. Insufficient TQP credit is given to program participants for prior education, experience, and industry certifications.
5. Participation in the TQP did not always improve job performance.
6. The TQP has a positive impact on safety.

Recommendations

1. Conduct a top to bottom review of the TQP.
   - Based on study participant statements, the applicability and therefore the value of the TQP is in question.
     - Do the conditions that led to TQP creation still exist?
     - Is the program still needed?
     - Major modifications needed?

Recommendations

2. Conduct a job analysis for all TQP functional areas at the site and use the analysis as a basis to update qualification standards and supporting training course content.
3. Require that all TQP participants receive formal oversight training.
   - Oversight is the primary duty for all personnel in the TQP.

Recommendations

4. Encourage or require more use of industry/professional certification in the TQP.
   - Allowed but not utilized as much as possible
   - Eliminate or reduce duplication of effort for certain functional areas
   - Conform more closely to industry-wide standards (reciprocity)
5. Create a structured, monitored continuing training and education program for all TQP participants.
   - Eliminate the local requalification requirement.
   - Keeps workforce updated on latest advancements

Recommendations

6. Explore an internal collaboration with the DOE Project Management Career Development Program.
   - Modeled after TQP
   - Shares similar requirements
7. Explore external collaboration with other agencies such as the Department of Defense, the Nuclear Regulatory Commission, and related professional certification organizations.
   - Personnel at those organizations receive the same or similar training as many DOE TQP personnel
   - Sharing training resources could benefit all partners

Recommendations

8. Explore a partnership with co-located universities.
   - Universities with engineering departments are a potential source of employees, subject matter expertise, and research support
9. Maintain site TQP accreditation and inform stakeholders of the benefits.

- Discussion

Appendix B: List of Defense Nuclear Facilities

Department of Energy Defense Nuclear Facility Sites

1. Hanford Site (Washington)
2. Fernald Closure Project (Ohio – Inactive)
3. Idaho National Laboratory
4. Los Alamos National Laboratory (New Mexico)
5. Lawrence Livermore National Laboratory (California)
6. Miamisburg Environmental Management Project (Ohio - Inactive)
7. Nevada National Security Site
8. Y-12 National Security Complex / Oak Ridge National Laboratory (Tennessee)
9. Pantex Plant (Texas)
10. Rocky Flats Environmental Technology Site (Colorado – Inactive)
11. Sandia National Laboratories (New Mexico)
12. Savannah River Site (South Carolina)
13. Waste Isolation Pilot Plant (New Mexico)
14. West Valley Demonstration Project (New York - Inactive)

Appendix C: List of Functional Area Qualification Standards

Department of Energy Technical Qualification Program Functional Area Qualification Standards

1. Aviation Manager
2. Aviation Safety Officer
3. Chemical Processing
4. Civil /Structural Engineering
5. Confinement Ventilation and Process Gas Treatment
6. Construction Management
7. Criticality Safety
8. Deactivation and Decommissioning
9. Electrical Systems and Safety Oversight
10. Emergency Management
11. Environmental Compliance
12. Environmental Restoration
13. Facility Maintenance Management
14. Facility Representative
15. Fire Protection
16. General Technical Base
17. Industrial Hygiene
18. Instrumentation and Control
19. Mechanical Systems
20. National Nuclear Security Administration Package Certification Engineer
21. Nuclear Explosive Safety Study
22. Nuclear Safety Specialist
23. Occupational Safety
24. Quality Assurance
25. Radiation Protection

26. Safeguards and Security
27. Safeguards and Security General Technical Base
28. Safety Software Quality Assurance
29. Senior Technical Safety Manager
30. Technical Program Manager
31. Technical Training
32. Transportation and Traffic Management
33. Waste Management
34. Weapons Quality Assurance

Appendix D: Letter Requesting Permission to Access Technical Qualification Program Participants

Researcher's Name
Researcher's Address
City, State Zip

Dear FTCP Chair:

My name is Walter Meeks, and I am a doctoral student enrolled in the Richard W. Riley College of Education and Leadership at Walden University and a DOE National Training Center employee. I am interested in conducting a qualitative case study entitled ***An Evaluation of a Government Workforce Training and Qualification Program,*** with Technical Qualification Program (TQP) participants. The study will assess perceptions regarding the effectiveness of the TQP.

The purpose of the pending study is to gain an understanding of the effectiveness of the TQP from the participant point of view. The participant perspectives and supporting program documentation will be used to generate recommendations for program improvements. Ideal participants for the study include local TQP participants with at least two years of involvement in the TQP. Participants will be asked to take part in semistructured interviews regarding their experiences in and opinions about the TQP. The interviews will last from 30 to 60 minutes each. The identities of all participants and the organization will be kept confidential in educational materials submitted to Walden University. **The results of this study will be used to complete educational requirements at Walden University and will also be shared with you and other FTCP members (with your permission).**

This study poses little to no risks to participants. The findings from this study could be helpful in increasing TQP effectiveness at both the local and program-wide level. Upon your approval, letters will be sent to Service Center Directors and/or Field Office managers notifying them of such approval and informing them that TQP participants from their staff will be recruited for this study.

If you agree to allow me to conduct the proposed research, please reply in writing to the above address. You can also send written acknowledgement to xxxxxxxxxxxxx. Thank you for your cooperation in advance.

Sincerely,

Walter Meeks

Appendix E: Letter Acknowledging Permission Granted to Conduct Research Study

Researcher's Name
Researcher's Address
City, State Zip

Dear Service Center Director / Field Office Manager:

This correspondence acknowledges approval granted by the FTCP Chair to conduct a research study entitled ***An Evaluation of a Government Workforce Training and Qualification Program,*** with Technical Qualification Program (TQP) participants. I am a doctoral student enrolled in the Richard W. Riley College of Education and Leadership at Walden University and an employee at the DOE National Training Center. I will be conducting a study with TQP participants to assess their perceptions regarding the effectiveness of the program.

The purpose of the pending study is to gain an understanding of the effectiveness of the TQP from the participant point of view. The participant perspectives and supporting program documentation will be used to generate recommendations for program improvements. Ideal participants for the study include local TQP participants with at least two years of participation in the TQP. Participants will be asked to take part in semistructured interviews regarding their experiences in and opinions of the TQP. The interviews will last from 30 to 60 minutes each. The identities of all participants and the organization will be kept confidential in educational materials submitted to Walden University. The results of this study will be used to complete educational requirements at Walden University and will also be shared with FTCP members.

This study poses little to no risk to participants. The findings from this study could be helpful in increasing TQP effectiveness at both the local and program-wide level. I will need your assistance in identifying potential participants from your office. Please be aware that the names of chosen participants will remain confidential. Please contact me at your earliest convenience to arrange a meeting date and time to discuss participant recruitment. I can be reached at xxx-xxx-xxxx. Thank you in advance for your cooperation in this matter.

Sincerely,

Walter Meeks

Appendix F: Initial Contact Email and Consent Form

Initial Contact Email to Potential Interviewees

Dear xxxxx,

My name is Walter Meeks, and I am a doctoral student enrolled at Walden University. I am also a DOE National Training Center (NTC) employee. I will be conducting a project reviewing parts of the DOE Technical Qualification Program and would like to interview participants to assess their perceptions regarding the effectiveness of the program. This project is separate from and independent of my duties at the NTC. Participation is optional and your identity would be protected. Attached is a copy of the participant consent letter for your review. If you are interested in participating, please contact me via the email or phone number listed below. I will contact you within 7 days to set up an initial meeting. Thank you.

Walter Meeks

CONSENT FORM

To Participate in the Research Study
An Evaluation of a Government Workforce Training and Qualification Program
Semistructured Interviews

You are invited to take part in a research study entitled ***An Evaluation of a Government Workforce Training and Qualification Program*.** You were chosen to participate in this study because you are in the Technical Qualification Program (TQP) with at least two years of participation. As such, you are a valuable resource for this pending study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This research study is being conducted by a researcher named Walter Meeks, who is a doctoral student at Walden University and an employee of the DOE National Training Center. However, this study is separate from that role.

Background Information:
The purpose of the pending study is to gain an understanding of the effectiveness of the TQP from the participant point of view.

Procedures:
If you agree to be in this study, you will be asked to participate in a semistructured interview lasting between 30 and 60 minutes. This interview will be conducted face-to-face. The interview will be scheduled at a time that is convenient to you. If you decide to participate, it will be held at a location, chosen by you, that is neutral to your work place that will allow you to express your feelings freely. This interview session will be audio taped, if you permit. After the recording has been transcribed and analyzed, you will be contacted by the researcher within the next 2 weeks to review the transcript and discuss the validity of the responses if you desire. Your review of the transcript should take no more than 30 minutes. A few sample questions are listed below:

1. What do your coworkers think of the Technical Qualification Program?
2. Did you take any National Training Center (NTC) courses required by or useful for the Technical Qualification Program?
3. Have your training needs ever been assessed? If so, were those needs met?

Voluntary Nature of the Interview:
This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one employed at your organization will treat you differently if you decide not to be in the study. If you decide to participate in the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as fatigue or stress. Being in this study would not pose risk to your safety or wellbeing. The benefit of participating in this interview is to give

you an opportunity to provide leadership in increasing TQP effectiveness at the local and perhaps program-wide level.

Payment:
There is no compensation for participating in this interview.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. In addition, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by locking all materials in a container for which the researcher holds sole access. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or, if you have questions later, you may contact the researcher via phone at xxx-xxx-xxxx or email, xxxxxxxx. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is xxx-xxx-xxxx. Walden University's approval number for this study is 01-06-16-0330391 and it expires on January 5, 2017.

The researcher will give you a copy of this form to keep.

Statement of Consent:
I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below, I understand that I am agreeing to the terms described above.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Appendix G: Interview Questions

Technical Qualification Program Effectiveness

1. How would you rate organizational support for Technical Qualification Program (high/medium/low)? (Follow-up for why level was chosen)
2. How does the field office/site manager support Technical Qualification Program?
3. How does your supervisor support Technical Qualification Program (motivation from, etc.)?
4. What do your coworkers think of the Technical Qualification Program?
5. Did/does your organization provide sufficient time and other resources to work on and complete your Technical Qualification Program requirements?
6. Does your organization provide training that supports your work requirements with required resources? (Time away, funding, etc.) (Follow-up: If so, how so; if not, why not?)
7. Did you take any National Training Center (NTC) courses required by or useful for the Technical Qualification Program? (Follow-up: What were those courses?)
8. Describe the quality of content and presentation of NTC courses.
9. Were the NTC courses helpful for the Technical Qualification Program? (Follow-up: If so, how so; if not, why not?)
10. Were those courses helpful for your professional development and job needs? (Follow-up: If so, how so; if not, why not?)
11. Did you or your supervisor set any goals or have any expectations prior to or during the courses with respect to using the new knowledge on the job? (Follow-up – If yes, request examples.)
12. What changes, if any, would you request from the NTC in the form of course revisions or course development to support your job needs and/or Technical Qualification Program needs?

Program Applicability to Position

13. How well does your Technical Qualification Program functional area match your actual job requirements?
14. Do you consider Technical Qualification Program supports/supported your professional development in your work area? (Follow-up: If so, how so; if not, why not?)
15. Have your training needs ever been assessed? If so, were those needs met?
16. Will participation in the TQP enhance your career? (Follow-up: If so, how so; if not, why not?)
17. What do you like about the Technical Qualification Program?
18. What do you dislike about the Technical Qualification Program?
19. What changes would you recommend for the Technical Qualification Program?
20. Do you feel that you had the correct educational or experiential background to complete the Technical Qualification Program qualification process? (Follow-up: If not, why not?)

Program Impact on Behavior

21. Did you or your supervisor set any goals or have any expectations prior to or during the Technical Qualification Program process with respect to using the new knowledge on the job? (Follow-up – If yes, request examples.)
22. Does knowledge gained from the Technical Qualification Program process help you perform your job? (Follow-up: If so, how so; if not, why not?)
23. Do/did you consciously think about how you could use knowledge gained from Technical Qualification Program on the job? (Follow-up: If so, how so; if not, why not?)
24. Have you ever revisited Technical Qualification Program related materials/concepts later on to review or seek guidance for job requirements? (Follow-up: If so, how so; if not, why not?)

25. Did participation in or completion of TQP requirements affect your confidence in performing your job? (Follow-up: If so, how so; if not, why not?)
26. Did you receive program oversight and assessment training as part of TQP? If so, was it useful and did it enhance your oversight role? Explain.
27. Have you had the opportunity to provide formal feedback on your experience in TQP to managers/management? If so, what was the feedback and format used for it?
28. Did your on-the-job behavior, productivity, or performance level change because of being in the TQP? If so, how so?

Program Impact on Safety

29. Did the TQP allow you to perform your job in a safer manner? (If so, how so?)
30. Did the TQP aid you in your oversight role to ensure that contractors performed work in a safe manner? (If so, how so?)
31. (Additional safety related questions will be based on the responses to questions 29 and 30, and the program functional area of the participant).