

AN EVALUATION OF AVEDA CORPORATION'S ENVIRONMENTAL AND
SAFETY MANAGMENT SYSTEM (ESMS) ORIENTATION/INDUCTION
TRAINING IN AN ISO 14001 FRAMEWORK

by

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ABSTRACT

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An Evaluation of Aveda Corporations Environmental and Safety Management (ESMS) Orientation/Induction Training in an ISO 14001 Framework.			
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The purpose of this study was to evaluate the effectiveness of Aveda Corporation's Environmental and Safety Management System (ESMS) Orientation/Induction training for manufacturing operations employees at the Blaine, MN facility.

The review of literature examined training evaluation models as well as mandatory and voluntary environmental, health and safety (EHS) training requirements. The review focused on Kirkpatrick's (1998) four levels of evaluation, which include the measurement of learners' reaction, learning, behavior changes and business results. Philip's (1997) fifth level of evaluation, return on investment, and the importance of intangible results were also discussed.

Surveys were distributed to manufacturing operations employees to measure perceived and actual knowledge in ten EHS areas as required by Aveda's ESMS manual. Conclusions were based on the review of literature and survey results. Overall, results indicate that participants averaged from 91% to 95% on actual knowledge measurement questions. Results of perceived knowledge questions found that 92.1% of participants felt that they were very to extremely knowledgeable of the ESMS requirements. A significant gap was found between perceived and actual knowledge in the area of machine guarding.

Although overall ESMS perceived and actual knowledge was good, room for improvement exists. Implementation of the recommended change may help to improve the ESMS Orientation/Induction training at Aveda.

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CHAPTER I: INTRODUCTION

Training is a systematic process that usually involves determining training needs; setting training objectives; determining subject content and training schedules; selecting participants, facilities, instructors, and audiovisual aids; coordinating the program; and evaluating the program (Kirkpatrick, 1998). Although many models exist, most include evaluation as a critical element to ensure effective training (Kristiansen, 2004).

Fundamental training evaluation models depict multiple steps or levels of evaluation that measure the learner's reaction, learning, and behavior as well as business impact. Some literature suggests that intangible training benefits also should be examined. Today's trends require that training programs show evidence of their effectiveness through evaluation methods (Phillips, 1997). Environmental, Health and Safety (EHS) training is no exception to this trend.

The management of EHS risk in the workplace has become an integral part of doing business (Robson, Shannon, Goldenhar, & Hale, 2001). Companies must take proactive approaches to managing EHS to remain competitive in today's world of tight margins. Agencies like the Occupational Health and Safety Administration (OSHA) and the Environmental Protection Agency (EPA) have legally required employers to provide healthy, safe, and environmentally responsible work environments for decades. More recently, businesses have begun to comply with voluntary EHS standards endorsed by organization such as the International Standards Organization (ISO) and the American National Standard Institute (ANSI). These standards claim to offer the framework for enhancing EHS management. Regardless of mandatory or voluntary status, all effective EHS management demands some component of employee training. OSHA and the EPA

require specific compliance training for certain types of work, while the ISO 14001 standard provides a framework for environmental management with a training component. Finally, the ANSI Z490.1 standard provides the criteria for best practices in EHS training.

Aveda Corporation is a Minnesota-based manufacturer, wholesaler and retailer of plant, flower, and mineral-based professional salon, spa, personal care, and life style products (Aveda, 2001/2002). Founded in 1978 in Minneapolis, MN, Aveda's manufacturing operations facility is now located in Blaine, MN and also serves as the corporate headquarters for the company. In 2002, approximately 200 permanent staff were working in manufacturing operations located in Blaine, MN. A little over half of these are full time manufacturing operations production workers.

The Aveda Corporation prides itself on environmental leaderships and responsibility, which is reflected in its mission statement, vision, beliefs and subsequent business policies (Aveda, 2001/2002). The company became ISO 14001 certified in 2002 at the request of its parent company. Although ISO 14001 only focuses on environmental management, Aveda has expanded its environmental management system to include safety and health as additional, yet equally important services. This system is known as Aveda's Environmental and Safety Management System (ESMS).

Aveda's ESMS requires that all new manufacturing operations employees be trained in ten areas outlined in Aveda's ESMS Manual known as the "Orientation/Induction Training." These areas cover required compliance training as well as additional training outlined by ISO 14001 and by Aveda's parent company for all new manufacturing operations employees working at the Blaine, MN facility (Aveda, 2003).

The training is conducted in conjunction with the new employee orientation on a biweekly basis. Current EHS training includes a lecture regarding Aveda's ESMS practices and current formal evaluation methods include a quiz covering Aveda's emergency preparedness and response plan; audits conducted by Aveda's parent company, insurance carrier and ISO 14001 auditors; and accident and injury statistics. ESMS refresher training is also conducted annually for all Aveda manufacturing operations employees.

Statement of the Problem

A 2003 ESMS audit conducted by Aveda's parent company found that knowledge of the ESMS policy and some of its components was inconsistent among employees. In response to these findings, this paper will evaluate the effectiveness of Aveda's current ESMS Orientation/Induction Training for Aveda's manufacturing operations employees working at the Blaine, MN location.

Purpose of the Study

The purpose of this study is to evaluate Aveda's current ESMS Orientation/Induction training for manufacturing operations employees working at Aveda's Blaine, MN location. This study provides answers to the following questions:

1. What training is currently being conducted to cover Aveda's ESMS Orientation/Induction training requirements for new manufacturing operation employees?
2. Does Aveda's ESMS Orientation/Induction Training cover all required objectives?

3. What criteria are currently being utilized to evaluate the effectiveness of Aveda's ESMS Orientation/Induction Training?
4. What training evaluation tools are needed to adequately evaluate the effectiveness of Aveda's ESMS Orientation/Induction Training?
5. What areas of Aveda's ESMS Orientation/Induction Training need improvement?

Assumptions of the Study

1. Trained and surveyed employees' English proficiency allows them to understand the current training and survey instrument.
2. Participants who completed the survey accurately rated their knowledge of the ESMS Orientation/Induction training requirements.

Definitions/Abbreviations

American National Standards Institute (ANSI). "The American National Standards Institute (ANSI) is a private, non-profit organization (501(c)3) that administers and coordinates the U.S. voluntary standardization and conformity assessment system" (ANSI, 2004, para. 2).

Environmental Protection Agency (EPA). "EPA's mission is to protect human health and to safeguard the natural environment — air, water, and land — upon which life depends" (EPA, 2004, para. 1).

International Standards Organization (ISO). "ISO is a network of the national standards institutes of 148 countries, on the basis of one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system" (ISO, 2004a, para. 1).

ISO 14001 – “The ISO 14000 family is primarily concerned with “environmental management’. This means what the organization does to:

- minimize harmful effects on the environment caused by its activities, and to
- achieve continual improvement of its environmental performance.” (ISO, 2004b, para.1)

Aveda’s Environmental and Safety Management System (ESMS). It is based on ISO 14001 but incorporates safety issues into it’s framework (Aveda, 2001/2002).

Evaluation-“to determine the significance, worth, or condition of usually by careful appraisal and study” (Merriam-Webster, 2003, para. 1).

National Institute for Occupational Safety and Health (NIOSH). “NIOSH is in the U. S. Department of Health and Human Services and is an agency established to help assure safe and healthful working conditions for working men and women by providing research, information, education, and training in the field of occupational safety and health. NIOSH provides national and world leadership to prevent work-related illness, injury, disability, and death by gathering information, conducting scientific research, and translating the knowledge gained into products and services” (NIOSH, 2004, find para. 2).

Occupational Safety and Health Administration (OSHA). “OSHA is in the U.S. Department of Labor and is responsible for developing and enforcing workplace safety and health regulations” (NIOSH, 2004, find para. 2)

Limitations of the Study

1. The instrument used had no documented measures of validity or reliability.

2. Since past training was the subject of evaluation, level one (reaction) and four (business impact) evaluations could not be conducted.
3. The survey instrument only measured post-training level two (learning measurement). It did not measure pre-training knowledge.
4. The survey instrument did not allow for open-ended comments on the training event.
5. Surveys were conducted group setting where people were able to share information.
6. Surveys were administered just after annual ESMS and Employee Right to Know training was conducted for the majority of participants, which may skew knowledge rating in this area.
7. Self-rating of knowledge is not always a true representation of actual knowledge.
8. The survey did not separate participants by shift, which may have been beneficial.
9. The survey did not ask line leads or area leads to indicate their job titles on the survey instrument.
10. Not all employees surveyed responded to every question.
11. Time limitation of the researcher only allowed for limited evaluation data collection and did not allow for testing and refining of the survey instrument.

Methodology

Surveys using ranking scales and open ended questions were designed to evaluate the effectiveness of the ESMS training were distributed to Aveda manufacturing operations

employees, at the Blaine, Minnesota location, who work in the following areas: aroma compounding, assembly/filling, chemical receiving, component receiving, compounding, facilities, production maintenance, shipping, and storage and warehouse.

Participants completed the surveys during four separate sessions in conjunction with other OSHA compliance trainings and returned them to the investigator. Survey participants received a letter prior to taking the survey that outlined the purpose and confidentiality measures involved in the survey, as well as describing that the survey is strictly voluntary and confidential.

Participants were asked to complete a survey of 11 questions, which took approximately 5-10 minutes to complete. The intent of the survey was to assist the investigator in determining the effectiveness of ESMS Induction/Orientation training for Aveda's manufacturing operations employees and help to define what areas of required training needs enhancement.

Literature was reviewed to determine if all legal training requirements are being met, to determine if evaluation is an important part of training and to examine the best methods for evaluating training and specific EHS training.

CHAPTER II: LITERATURE REVIEW

Training Evaluation

An evaluation is a systematic process to determine the worth, value, or meaning of an activity or process (Merriam-Webster, 2003). Every instructional design model includes evaluation as a principal element that ensures the effectiveness of training (Kristiansen, 2004). Training evaluation is used to accomplish several objectives: to justify the existence and value of those performing the training, to make a determination as to if the training should be continued, and/or to gain information on how to improve the training (Kirkpatrick, 1998). Training program improvement is the most popular reason for training evaluation. Kirkpatrick provided a fundamental evaluation model that is crucial to a 10 step instructional training process which includes determining training needs; setting training objectives; determining subject content and training schedules; selecting participants, facilities, instructors, and audiovisual aids; coordinating the program; and evaluating the program. This paper will focus on the evaluation portion of the training process.

When evaluating training effectiveness, many methods may be utilized. Evaluation method selection depends on a number of variables that may include type of training intervention, accessibility to data and employees, and financial and time constraints (Phillips, 1997). The most common methods utilized include surveys, questionnaires, interviews, focus groups, tests, observation, and performance records. Methods used may also depend on the type of training evaluation being conducted. Multiple models of training evaluations exist in the literature.

Kirkpatrick's model of training evaluation is perhaps the most well known framework for outlining areas of evaluation (Phillips, 1997). The levels are sequential in that each level has a subsequent impact on the next level. As evaluation progresses each level becomes more difficult and time consuming, but provides more valuable information (Kirkpatrick, 1998). The four levels ask the following questions:

1. Reaction – were learners pleased with the program?
2. Learning – what was learned by the learners?
3. Behavior – was behavior changed due to the learning that took place?
4. Results – did the change in behavior affect the organization?

Level one measures the learners' reaction to the training, which is also known as customer satisfaction. This level examines how well the training was liked but can also capture data about the major functions of the whole design and delivery process (Kristiansen ,2004). Level one evaluation usually consists of surveys that ask participants to rate different areas of the training and also solicit comments. These surveys are often referred to as “smile sheets” and are the most popular and widely used type of training evaluation. Questions may target the training design, instructor, exercise, application, and logistics, depending on the relevance of a specific training event. Kirkpatrick (1998) suggests that 100% of training participants provide level one reaction feedback.

The actual learning that takes place as a result of the training is measured in level two. Kirkpatrick (1998) defines learning as “the extent to which participants change attitudes, improve knowledge, and/or increase skill as a result of attending the program” (p. 20). Learning has occurred if one or more of these criteria have been met. It is critical to recognize that evidence suggesting that learning has occurred does not guarantee that

the participant will apply the knowledge in a work setting or that the participant will change his or her behavior. Evaluations may include pre and/or post tests administered to participants (Kristiansen, 2004). Like a level one evaluation, Kirkpatrick suggests that 100% of training participants be measured at level two to determine if learning has occurred.

Level three examines behavior changes occurring due to the training event. Behavior is often more difficult to measure than level one or two evaluations since behavior change is dependant on participants' desire to change, knowledge of how and what to do, work climate, and reward system for behavior change (Kirkpatrick, 1998). Behavior changes can be measured via surveys, questionnaires, and/or observations (Kristiansen, 2004).

Measuring business results is Kirkpatrick's fourth level of measurement. These evaluations consist of specific, quantifiable business objectives (Kristiansen, 2004). Business results may include increased productivity, quality, sales, and profits or reduced cost, accident frequency or severity, and employee turnover. It is the "bottom line" measurement of training that is often used to justify training at high management levels.

Recognizing weaknesses in Kirkpatrick's model, Kaufman and Keller (1994) developed a modified version of Kirkpatrick's model known as Kaufman's Five Levels of Evaluation:

1. (a) Enabling – The availability and quality of human, financial, and physical resources as inputs.
(b) Reaction – The methods, means, and processes acceptability and efficiency.

2. Acquisition – Individual and small group mastery and competency.
3. Application – Individual and small group product utilization within the organization.
4. Organizational output – Contributions and payoff to the organization.
5. Societal Outcomes – social and client responsiveness, payoffs and consequences.

Clearly, the model identifies the need to consider resources necessary for successful interventions and addresses societal and client responsiveness measuring the impact the training intervention had on the organizations surrounding environment (Phillips, 1997).

Another model developed by Warr, Bird, and Rakman (1970) provides a wider scope for evaluation. The CIRO model also includes four levels:

1. **C**ontext evaluation – Obtaining and using information related to the current operational situation.
2. **I**nteraction evaluation – Obtaining and using information about available training resources
3. **R**eaction evaluation – obtaining and using information about participants' reactions to improved the process.
4. **O**utcome evaluations widely – obtaining and using information about the outcomes or results.

The model credits the outcome evaluation as the most important part of the evaluation (Phillips, 1997).

The Context, Input, Process, and Products (CIPP) evaluation framework is yet another model. The model, developed by educators, provides a framework for developing

goals, planning training programs, guiding implementation, and reviewing decisions (Galvin, 1983; Phillips, 1997).

The Phillips (1997) Five-Level ROI Framework embraces Kirkpatrick's four step evaluation model, but adds a fifth step for training evaluation:

1. Reaction and Planned Action – Measure participants' reaction to the program and outlines specific implementation plans.
2. Learning –Measures skills, knowledge or attitude changes.
3. Job Application – Measures changes in behavior on the job and the application of the training material.
4. Business Results - Measures business impact of the program.
5. Return on Investment (ROI) – Measures the monetary value of the results and cost of the program (often as a percentage).

Phillips' level four may include cost and time savings as well as quality and output improvements, but also include subjective data like employee and customer satisfaction and retention. Phillip's Level 5 is examining the return on investment (ROI) of the training. ROI provides a cost benefit ratio that compares the costs of the training with the monetary value of the business impact that occurs due to the training.

Phillips and Stone (2002) suggest later that intangible benefits also be examined. These are benefits that either cannot or should not be expressed numerically. Common intangible benefits may include increased organizational commitment, improved work climate, reduction of employee stress, reduced turnover, improved teamwork, improved communication.

This paper will focus on Phillips' Model of Evaluation. Phillips (1997) suggests that the most important use of level two data is to improve training program design since low level two responses may indicate inadequate topic coverage.

Environmental Health and Safety Training Evaluation

“In EHS specific training the difference between effective and ineffective training may be death, injury, pain, and lost profits” (Robotham, 2001). In 1998 Cohen and Colligan published a literature review that assessed occupational safety and health training. The review found that specific OSHA training requirements are fragmented, which may lead employers opting to follow minimal requirements with marginal results. OSHA Voluntary Training Guidelines attempt to address this issue and will be discussed later in this chapter. These guidelines, however, have yet to prove evidence of merits in regard to impacting workplace safety/health problems. Cohen and Colligan's review also examined training interventions targeted at enhancing employee awareness of hazards in the workplace in the areas of traumatic injury forces, toxic chemicals/materials, harmful physical factors, ergonomic stressors, and biological/infectious agents.

Crucefix (2001) suggests that safety-training evaluations are also often limited to participant reaction and/or the impact of training. He states that both the inputs and outputs of the quality and quantity of safety training should be evaluated to achieve the best possible program results for health and safety programs. Inputs include things such as lesson plans, teaching techniques, training aids, and participant course critiques. Outputs include pre and posttests as well as accident and injury statistics. He outlines four key criteria for measuring safety training effectiveness that are similar to Kirkpatrick's model that should be planned as the training is being designed. Like

Kirkpatrick, Crucifix's first three criteria are reaction, learning and behavior measures. He defines the fourth "impact of training" as a comparison of course goals against the achieved results. Impact of training evaluation should include soft measures, like work climate and safe attitudes, as well as hard measures, like accident and injury experience. These output measurements must be related to the results of the training such as loss reduction to people, property, process or environment and increase employee motivation, retention or quality improvements. Measures of ROI are not included as a measure of effective safety training in this model.

Rothbotham (2001) also points out that evaluation is a key factor in an effective safety training process. This process includes:

1. Conducting a task analysis
2. Identifying critical tasks
3. Reviewing accident reports
4. Surveying and interviewing employees and
5. Reviewing legislation

Similar to Crucefix, Rothbothom states that safety training can be evaluated at any of three stages, inputs, outputs and outcomes. Inputs include costs and or time used to develop the training. Outputs can be measured by number of participants and cumulative training costs and could also include a percentage of trained participants versus a set performance standard. Outcome measures are basically Kirkpatrick's four levels of measurement, reaction, knowledge, behavior, and results. Rothbothom does not include ROI as a way to of measure results.

Machles (2003) adds ROI measurements as a critical element in addition to Kirkpatrick's four levels of training evaluation in determining the effectiveness of safety training. He suggests that ROI for safety training must compare the calculated cost of the training, including the trainers' and employees' time and all involved costs to the savings from avoided injuries and accidents.

OSHA is the governing body for the protection of workers health and safety (OSHA, 1998). Although OSHA does not specifically address employers' responsibility to provide health and safety information and instruction to employees it requires employers to "comply with occupational safety and health standards promulgated under this Act" (p. 1). OSHA enforces over 100 standards for workplace hazard control that include training requirements. Of these, 13 are applicable to Aveda's new employees working in manufacturing operations. Appendix A outlines Federal and State regulatory compliance safety training requirements applicable to all new employees working in Aveda's manufacturing operations. It is important to note that the State of Minnesota is a state run OSHA facility, meaning that employers are required to adhere to any state mandated safety and health standard that may be more stringent than Federal OSHA standards

In response to the complexity involved in managing scale regulatory compliance training, OSHA developed voluntary training guidelines to aid employers in providing adequate health and safety training (OSHA, 1998). OSHA's training guidelines follow well-documented models and include

1. Determining if Training is Needed
2. Identifying Training Needs

3. Identifying Learning Activities
4. Conducting the Training
5. Evaluating Program Effectiveness
6. Improving the Program

Unlike Kirkpatrick, Phillips and Stone, OSHA only suggests a written or thought out training evaluation plan that includes three methods of evaluation (OSHA, 1998). The first is “student opinion” to examine relevance and appropriateness of training. The second is “supervisor observation” which suggests that workplace supervisors are in the best position to observe employee performance changes due to training. Lastly is “workplace improvement” which includes all changes that may occur in the workplace including accident/injury statistic reductions.

NIOSH is a federal organization that performs testing and makes recommendations to OSHA on safety related requirements (Robson, Shannon, Goldenhar, & Hale, 2001). NIOSH defines a safety intervention as “as an attempt to change how things are done in order to improve safety” and includes safety-training programs as a type of safety intervention (p. 1). NIOSH outlines a seven-step training model that includes an evaluation section based on Kirkpatrick’s four levels (Cohen & Colligen, 1998). The steps are (1) needs assessment, (2) establishing training objectives, (3) specifying training content and media, (4) accounting for individual differences, (5) specifying learning conditions, (6) evaluating training, and (7) revising the training. Robson et al. (2001) identified several types of intervention evaluation methods that can be used to measure effectiveness. The first, a needs assessment, determines what type of intervention is needed. A process evaluation assesses the quality of the intervention

delivery and identifies areas for improvement. An effectiveness evaluation determines whether an intervention has had the effect intended on outcomes and estimates the size of the effect. A cost-outcome analysis determines the net cost of an intervention relative to its health effects. A cost-effectiveness analysis compares different alternatives using cost effective ratios. A cost-benefit analysis compares different intervention alternatives using net benefits. The authors point out that intervention and evaluation need to be planned at the same time and that true effectiveness measures must include quantitative techniques. Using quantitative and qualitative methods combined provides “an especially rich source of information” (p. 12).

Quantitative safety outcome measures suggested by the Robson et al. (2001) include administrative data collection of injury and other statistics, behavioral and work site observation, employee surveys, analytical equipment measurement, and workplace audits. Suggested qualitative measurement methods include interviews and focus groups, questionnaires with open ended questions, observations, and document analysis.

The American National Standards Institute (ANSI) is an American organization that provides consensus standards to aid in employee health and safety (ANSI, 2001). ANSI standard Z490 on Criteria for Accepted Practices in Safety, Health and Environmental Training was accredited in 1997 due to the recognized need to improve safety, health and environmental training. The standard covers training development, delivery, evaluation and management of training programs and applies to a broad range of safety health and environmental training. It is the only standard that encompasses the combination of environmental health and safety training. Sections 6.1 and 6.2 cover the general criteria

and evaluation approaches of training evaluation. General criteria for ANSI Z490

Evaluation approaches include:

1. The evaluation approaches for each training event and the tools for implementing them shall be established during training development.
2. An evaluation shall be made of the trainees' achievement of each learning objective, considering the performance, conditions, and criteria specified in the learning objective.
3. The evaluation tools used shall be reliable and valid measures of the trainee's achievement of the learning objective.
4. Successful completion of each evaluation shall be specified during training development.
5. Training providers shall furnish trainees with the results of any test or task observation included as part of the evaluation.
6. Training development shall include procedures for assisting or retraining trainees who do not achieve the learning objectives.
7. Each trainee or trainer being evaluated shall be properly identified.
8. Evaluation shall comply with all applicable regulations.
9. The training program shall include periodic evaluation of trainees in relation to the learning objectives and determining the effectiveness of the program (p. 15).

To provide some framework for the management of workplace environmental risk, in 1996 ISO published its first edition of the ISO 14001 Environmental Management Systems Standard (ISO, 2004b). International Standards covering environmental management are intended to “provide organizations with the elements of an effective

environmental management system which can be integrated with other management requirements to assist organizations to achieve environmental and economic goals” (p. v).

The ISO 14001 certification requires that companies develop an Environmental Management System (EMS) to integrate environmental management into business operations. One ISO 14001 EMS requirement is the training, awareness and competence of employees (ISO, 2004b). Essentially, employees need to be trained and competent in how their work may significantly affect the environment. As companies have embraced the new ISO 14001 to manage environmental risk, safety and health risk remained separate entities to be managed as such.

Aveda's ESMS

Aveda's ESMS expands the ISO 14001 Environmental Management System requirements to include issues related to employee health and safety. Aveda's ESMS manual requires all new Aveda manufacturing operations employees to receive training that covers the following components of the ESMS:

- Awareness on ESMS and the Aveda Corporation – Blaine Manufacturing Operations Environmental and Safety Policy Statement.
- Instruction on the evacuation protocol and their responsibilities in an emergency situation.
- Instruction on whom to notify in the event they witness and emergency and any other parts of the plan that directly affect them.
- Instruction on ergonomics and safe lifting procedures.
- Awareness on machine guarding and the purpose of protecting employees from moving machinery and equipment.

- Awareness on the Control of Hazardous Energy and the difference between authorized and affected employees.
- Instruction on how to report accidents and incidents.
- Instruction on housekeeping and the importance of keeping hallways clear of debris, pallets, and similar materials to prevent slips/trips/falls.
- Awareness of warning signs and tags.

These training requirements are based on EHS regulatory compliance and Aveda's parent company requirements.

Summary

Chapter 2 focuses on the literature pertaining to training evaluation, specifically, EHS training evaluation. As previously mentioned, training evaluation needs to be measured at a minimum of four levels: reaction, learning, behavior, and business impacts (Kirkpatrick, 1998). Other authors suggest that ROI and intangible impacts also be considered. EHS training and training evaluation may be mandatory or voluntary as outlined by federal and state standards, standards organizations, and/or internal company requirements. Regardless, training evaluation is crucial to measuring EHS performance in an organization.

This review of the literature addressed the first four questions that the researcher intended to answer in this study:

1. What training is currently being conducted to cover Aveda's ESMS Orientation/Induction training requirements for new manufacturing operations employees?

2. Does Aveda's ESMS Orientation/Induction Training cover all required objectives?
3. What criteria are currently being utilized to evaluate the effectiveness of Aveda's ESMS Orientation/Induction Training?
4. What training evaluation tools are needed to adequately evaluate the effectiveness of Aveda's ESMS Orientation/Induction Training?

In reviewing the literature, Aveda's ESMS Orientation/Induction training currently covers all required areas. Some evaluation tools are being used, but not all levels of evaluations are being conducted.

CHAPTER III: METHODOLOGY

A 2003 ESMS audit conducted by Aveda's parent company found that knowledge of the ESMS policy and some of its components were inconsistent among employees. In response to these findings, OSHA, ANSI, ISO 14001, EPA and Aveda's parent company EHS requirements were reviewed to determine if Aveda's ESMS Manual covered all required areas for EHS training. This chapter will include information about how the sample was selected, a sample description, and the instrument used. Data collection and analysis procedures will also be given. The limitations of the methodology will end the chapter.

Subject Selection and Description

Study subjects included Aveda Corporation's manufacturing operations employees working at the Blaine, Minnesota location that work in the following areas: aroma Compounding, assembly/filling, chemical receiving, component receiving, compounding facilities, production maintenance, shipping and storage and warehouse. Participants were selected based on the training requirements of the Orientation/Induction section of Aveda's ESMS manual.

Instrumentation

The data collection instrument for this study was designed for ease of participant use. The data collection instrument was a survey that was broken into two sections: one for training evaluation and another for demographic information. The training evaluation section contained seven questions. Questions one and three through seven of the evaluation section asked open-ended questions to assess participants' knowledge of target ESMS components of specific interest to Aveda. Question two of the evaluation section

asked participants to use rank scales to rate their knowledge of each of the 10 components required for Aveda's Orientation/Induction Training as outlined in Aveda's ESMS manual. The demographic section contained questions to determine length of participants' employment at Aveda, if participants had worked as a contract employee prior to full-time Aveda employment, the participants' jobs or departments, and whether participants were a member of a group that received specialized EHS training at Aveda (such as a chemical spill responder). The survey instrument can be found in Appendix B.

Data Collection Procedures

Surveys were developed, distributed, and collected to assess employees' perceived knowledge of all 10 of the required ESMS Orientation/Induction Training requirements as outlined in Aveda's ESMS manual and asked them to answer some key questions related to the objectives of the training.

Surveys were distributed to Aveda manufacturing operation employees at the Blaine, Minnesota location in four groups over three separate days (December 16, 17 and 18th, 2003) at annual Employee Right to Know training, to cover as many of Aveda's manufacturing operations employees as possible.

Each group of participants was asked to complete the 11 question survey and return it to Aveda's EHS Compliance Manager or Supervisor. A total of 114 surveys were distributed and collected.

Surveys were not distributed to contract manufacturing employees or Aveda employees who worked outside of manufacturing operations. All Survey participants received a letter prior to taking the survey that outlined the purpose and confidentiality

measures involved in the survey, as well as describing that the survey is strictly voluntary and confidential.

Data Analysis

Data were analyzed using The Statistical Program for Social Sciences (SPSS), version 10.0. Data was ordinal in nature and appropriate statistics, primarily frequencies, were utilized. Cross tabulations were conducted to compare between employee job titles. Shift comparisons were conducted for compounding employees only.

Limitations

1. The instrument used had no documented measures of validity or reliability.
2. Since past training was the subject of evaluation, level one (reaction) and four (business impact) evaluations could not be conducted.
3. The survey instrument only measured post-training level two (learning measurement). It did not measure pre-training knowledge.
4. The survey instrument did not allow for open-ended comments on the training event.
5. Surveys were conducted group setting where people were able to share information.
6. Surveys were administered just after annual ESMS and Employee Right to Know training was conducted for the majority of participants, which may skew knowledge rating in this area.
7. Self-rating of knowledge is not always a true representation of actual knowledge.
8. The survey did not separate participants by shift, which may have been beneficial.

9. The survey did not ask line leads or area leads to indicate their job titles on the survey instrument.
10. Not all employees surveyed responded to every question.
11. Time limitation of the researcher only allowed for limited evaluation data collection and did not allow for testing and refining of the survey instrument.

Summary

This chapter identified the methods used to collect data and develop an evaluation system for Aveda's Orientation/Induction Training for manufacturing operations employees. A survey was developed and distributed to determine the effectiveness of Aveda's ESMS Orientation/Induction training for manufacturing operations employees working at Aveda's Blaine, MN location. The survey rated participants' perceived and actual knowledge of key components of the ESMS requirements. The data analysis and limitations of the study were also discussed.

CHAPTER IV: RESULTS

A survey was conducted to evaluate Aveda's current ESMS Orientation/Induction training for manufacturing operations employees working at Aveda's Blaine, MN location. This chapter includes the results of this research sorted by demographics and survey item analysis. The chapter concludes with a summary of finding.

Demographics

Item one asked participants to indicate the number of years that they had worked at Aveda as a full time employee. Of the 114 completed surveys, 26.3% (n=30) indicated they have worked less than one year as a full time Aveda employee, 42.1% (n=48) said they had worked from one to five years, and 28.9% (n=33) worked more than five years as a full time Aveda employee. A total of 2.6% (n=3) participants did not answer this question.

Item two asked participants to indicate if they had previously worked for a contracting company at Aveda and, if they had, for how long. Of the 114 participants, 75 indicated that they had previously worked at Aveda for a contract company prior to full time employment. Of those 75 participants, 86.7% (n=65) had worked for the contracting company less than one year, 5.3% (n=4) had worked from one to five years, and 5.3% (n=6) had worked more than five years. Thirty-nine participants indicated they had not previously worked for a contract company by leaving the section blank or writing "not applicable" next to the question.

Item three asked participants to indicate their primary work area (i. e., department). The majority of employees worked in the assembly/filling department (50.9%, n=58). The compounding department followed with 22.8% (n=26) across three

shifts. First shift compounders accounted for 12 employees while 2nd and 3rd shifts accounted for 9 and 5 employees respectively. Facilities and production maintenance employees accounted for 11.4% (n=13) and 8.8% (n=10), respectively. The other departments (aroma compounding, component receiving, shipping, and storage and warehouse) all accounted for less than 2% each of the participant population.

Item four asked participants to indicate if they were members of teams that may receive additional EHS training at Aveda. These teams included first aid responders, spill responders, and fork truck drivers. Thirty-eight point six percent (n=44) of the 114 participants indicated that they were members of one of the special listed groups. The majority (54.5%, n=24) of the 44 special team members indicated that they were licensed fork truck drivers. The remaining 45.5% (n=20) were either first aid responders, spill responders or some combination of all three special teams. Seven participants (15.9%) were members of all three teams.

Item Analysis

Item one asked participants if they had received training on Aveda's ESMS. Of the 114 surveys, 111 responded and three did not answer the question. Ninety-four point seven percent (n=108) answered that they had received ESMS training. Of the other six participants, 2.6% answered no and 2.6% did not answer implying that they did not receive training or that they did not know if they had received the training. All 5.2% (n=6) of the negative answers came from participants who indicated that they worked in the assembly/filling department.

Item two asked participants to rate their own knowledge of the 10 EHS areas required by Aveda's ESMS manual on a scale from one to five as follows:

1. I do not know what this is
2. This subject seems familiar to me.
3. I am slightly knowledgeable in this subject.
4. I am very knowledgeable in this subject.
5. I am extremely knowledgeable in this subject.

The results are summarized in Table 1.

Table 1

Summary of Aveda's Manufacturing Employee's ESMS Knowledge

ESMS Element	N	Percentage of Participants Who Chose Each Rating				
		1	2	3	4	5
1-ESMS Policy Statement	109	0.9	3.7	29.4	43.1	22.9
2-Emergency Evacuation	114	0	0.9	8.7	51.8	40.4
3-Emergency Notification	114	0	0	6.1	27.2	66.7
4-Ergonomics & Lifting	112	0	0.9	4.5	37.5	57.1
5-Employee Right to Know	114	0	0	8.8	38.6	52.6
6-Machine Guarding	111	0	1.8	9	33.3	55.9
7-Lockout/Tagout	114	0	1.8	8.8	36	53.5
8-Accident Reporting	113	0	0.9	6.2	42.5	50.4
9-Ergonomics, Slips, Trips, and Falls	114	0	0	5.3	30.7	64
10-Warning Signs & Tags	114	0	0	4.4	43	52.6

As indicated in Table 1, the majority of respondents were at least familiar with all 10 of the requirements. Ninety-two point one percent (n=105) scored an average of four to five across all requirements indicating that they very to extremely knowledgeable and 18.4% (n=21) scored all fives, indicating that they are extremely knowledgeable in all 10 ESMS requirements.

Knowledge of the ESMS policy statement was the element with the lowest scores; only 66.0% (n=72) chose four or five and 34.0% (n=37) chose one through three. The assembly/filling department (n=53) included 47.7% (n=25) participants that were slightly or less than slightly knowledgeable of the ESMS policy statement, 37.7% (n=20) very knowledgeable and only 15.1% very knowledgeable. Facilities, third shift compounding and production maintenance were leading scorers in this item with 92.3% (n=12), 80.0% (n=4), and 80.0% (n=8), being very to extremely knowledgeable, respectively.

Emergency notification was the area in which the participants reported the most knowledge. Approximately two thirds of the participants considered themselves extremely knowledgeable on this topic and over one fourth thought that they were very knowledgeable. No participants indicated that they were less than slightly knowledgeable in this subject, nor was any department more statistically relevant than another.

Item three asked if participants knew the phone number to call in case of an emergency at the Aveda facility. All but one participant answered this question. Of the 113 participants who responded, 95.6% (n=108) listed the correct extension. Four respondents (3.6%) listed extensions that were similar (0123, 123 or 1235) and one respondent (0.9%) listed 911 as the number to call.

Item four asked participants to whom they should report an accident or injury. All 114 participants responded to the question. Ninety-one point two percent of participants (n=104) listed supervisor, teams lead, areas lead or line lead, which are all acceptable answers to the question. Ten participants (8.8%) listed security, which is an acceptable but not as desirable of an answer.

Item five asked participants where they should go in case of an emergency evacuation at the facility. Three participants did not respond and are assumed to have no knowledge of the correct answers to this question. Ninety-seven point four percent (n=111) listed acceptable answers to this question. Ninety-three respondents (81.6%) answered “muster site” or listed a specific muster site at Aveda. This is the primary answer the survey was looking for. Fifteen point eight percent of respondents answered “nearest emergency exit or parking lot” which are acceptable answers.

Item six asked participants where they could find information about the chemical they work with. One hundred and ten of the participants answered this question. Although 93.9% (n=107) gave acceptable answers, 91.2% (n=104) gave the most desirable answers, which included material safety data sheets (MSDS), MSDS book, or paper chase. Less desirable but still acceptable answers, which included asking a supervisor or the EHS manager for information, were given by 2.7% (n=3). Two point seven percent (n=3) answered ESMS or manufacturing office. The remaining 3.5% (n=4) did not answer, indicating that they did not know the answer.

Item seven asked participants what to do if a piece of equipment is missing a safety guard. One hundred and five participants answered this question. Although 92.1% (n=105) gave acceptable answers, only 23.6% (n=27) provided answers that indicated they would turn off, shut down, lock or tag out, or not use the equipment. The other 68.5% (n=78) answered that they would report it to maintenance, leads, or supervisors; submit work orders; or fix or replace the guard. It is assumed the 7.9% (n=9) who did not respond did not know the answer to this question. This item was not cross tabulated at a

level that allows the researcher to determine which departments did not include to turn off, shut down, lock or tag out, or do not use the equipment in their answer.

Summary

This chapter presented the results of the survey instrument and addressed the final research question. “What areas of Aveda’s ESMS Orientation/Induction Training need improvement? The first four research questions were addressed in the review of the literature.

Demographic results indicate the majority of participants have worked as a regular Aveda employee from the one to five years and had not previously worked for a contracting company at Aveda manufacturing operations. About half of the total survey population (50.9%) was comprised of employees from the assembly/filling departments and roughly 60% were not members of special teams that require additional EHS training at Aveda.

Both the perceived and actual knowledge survey results indicate that, overall, Aveda’s ESMS Orientation/Induction Training is effective. Room for improvement does exist though, especially in the areas of knowledge of Aveda’s ESMS policy statement and knowing that equipment without guards should not be operated.

CHAPTER V: DISCUSSION

This study examined the effectiveness of ESMS Orientation/Induction training for manufacturing operations employees working at Aveda's Blaine, MN location. This final chapter provides a summary of the study's limitations, conclusions, and recommendations.

The study introduced the problem and provided a review of the literature to discover background information that would allow the researcher to support the objectives of the study as stated in Chapter 1. A survey was administered to support the research objectives through participant knowledge rating and knowledge measurement questions. Aveda manufacturing operations employees completed a total of 114 surveys. Surveys were tabulated and evaluated through frequency counts and cross tabulation. Demographic and item analysis data including a tabular presentation of the results of format for question two were also presented.

Limitations

Limitations to this study did exist and included:

1. The instrument used had no documented measures of validity or reliability.
2. Since past training was the subject of evaluation, level one (reaction) and four (business impact) evaluations could not be conducted.
3. The survey instrument only measured post-training level two (learning measurement). It did not measure pre-training knowledge.
4. The survey instrument did not allow for open-ended comments on the training event.

5. Surveys were conducted group setting where people were able to share information.
6. Surveys were administered just after annual ESMS and Employee Right to Know training was conducted for the majority of participants, which may skew knowledge rating in this area.
7. Self-rating of knowledge is not always a true representation of actual knowledge.
8. The survey did not separate participants by shift, which may have been beneficial.
9. The survey did not ask line leads or area leads to indicate their job titles on the survey instrument.
10. Not all employees surveyed responded to every question.
11. Time limitation of the researcher only allowed for limited evaluation data collection and did not allow for testing and refining of the survey instrument.

Conclusions

This study resulted in numerous conclusions, which follow.

1. The review of literature confirms that Aveda's ESMS Orientation/Induction Training covers all required objectives.
2. Current training evaluation of Aveda's ESMS Orientation/Induction Training does not cover all levels of evaluations as suggested by the literature review.
3. Participants scored from 91% to 95% acceptable answers on knowledge measurement questions one and three through seven indicating that overall knowledge of the target ESMS components is high. However, room for improvement exists.

4. Although 89.2% (n=99) rated themselves at four or higher (very to extremely knowledgeable) in the perceived knowledge portion of the survey, only 23.6% of the 92.1% acceptably answered questions 3 of the actual knowledge portion of the survey indicating that equipment without guards should not be used and needs to be turned off, shut down, or locked and tagged out. These results indicate that further training is needed in this area.
5. The research found that 92.1% of survey respondents rated their knowledge from four (very knowledgeable) to five (extremely knowledgeable) overall in the 10 required ESMS Orientation/Induction categories covered in question two. These results indicate that perceived knowledge of Aveda's ESMS required components is favorable with some room for improvement.
6. Knowledge of the ESMS policy statement scored the lowest with only 66.0% (n=72) scoring 4 to 5 and 34.0% (n=37) scoring that they were only slightly or less than slightly knowledgeable of the subject.
7. Knowledge of emergency notification scored the highest with 93.9% (n=107) stating they were extremely or very knowledgeable in the subject.

Recommendations

The following recommendation can be made based on the research conducted:

1. Update the existing Orientation/Induction training to include a comprehensive review of all ten required ESMS components and retrain all existing employees on these subjects initially and annually

2. Create an Aveda EHS handbook for new employee training to be used as a supplement to the NEO training that includes the 10 required components of the ESMS manual.
3. Emphasize the need to remove equipment without guards from service. Although employees generally seem to understand the need to report such circumstances, they did not convey the importance of turning off, shutting down or locking and tagging out the equipment before reporting and fixing the equipment.
4. Focus on reinforcing Aveda's ESMS policy statement.
5. Conduct a level one EHS reaction survey at the completion of each NEO training session and annual ESMS training.
6. Update the current level two learning evaluation post exam to include ESMS components other than emergency preparedness and response. In addition, consider the advantages of implementing a pre exam.
7. Develop and implement Level 3 Behavior Evaluations pertinent to EHS performance such as behavior observations and EHS audits on a regular basis.
8. Continue to track currently collected Level 4 Evaluation data such as accident/injury statistics and parent company, insurance, and ISO audits from the time of suggested improvement implementation to measure employee learning resulting from the updated ESMS training.
9. Although difficult to single out the ROI for ESMS Orientation/Induction training versus other EHS training, evaluate the necessity for measuring the ROI for EHS training at Aveda.

10. Consider the implementation of similar evaluations for contract employees working at Aveda's Manufacturing Operations.
11. Conduct an employee perception survey to measure the EHS culture at Aveda that includes an open-ended comment section for improvement feedback this will allow insight into intangible benefits of the updated training.
12. Reevaluate Aveda's ESMS Orientation/Induction training approximately 1 year after implemented changes to measure improvement.

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Appendix A

Regulatory Compliance Safety Training Requirements for All Aveda New Employees

Working in Manufacturing Operations

Safety Training Requirement for new employees	Federal OSHA Standard	MN OSHA
Emergency Action Plans	49CFR 1910.38	
Fire Prevention	1910.38	
Personal Protective Equipment	1910.132	
Specifications for Accident Prevention Signs and Tags	49 CFR 1910.145	
The Control of Hazardous Energy-Lockout/Tagout	49 CFR 1910.147	
Portable Fire Extinguishers	49 CFR 1910.157	
Electrical Training	49 CFR 1910.332	
Access to Employee Exposure and Medical Records	49 CFR 1910.1020	
Hazard Communication/ Employee Right to Know	49 CFR 1910.1200	Chapter 5206
Medical Service and First-Aid	49 CFR 1910.151	

Appendix B

Survey Instrument

1. Have you received training on Aveda's Environmental and Safety Management System (ESMS)?
 Yes
 No

2. Please rate your knowledge of the following subjects by placing an X in one of the columns.

	I am extremely knowledgeable in this subject.	I am very knowledgeable in this subject.	I am slightly knowledgeable in this subject.	This subject seems familiar to me.	I do not know what this is.
Awareness of the ESMS policy Statement					
Evacuation Responsibilities and Protocol					
Who to notify in the event on an emergency					
Ergonomic awareness and safe lifting procedures					
Employee Right to Know					
Machine Guarding					
Lock out/Tag out					
Accident Reporting					
Housekeeping-slips, trips, and falls					
Warning signs and tags					

3. What is the phone number to dial in case of an emergency at the facility?

4. In the event of an accident/injury, who should you report it to?

5. In the event of an emergency evacuation at the facility, where should you go?

6. Where can you find information about the chemicals you work with?

7. What should you do if you see a piece of equipment missing a guard?

Demographics

1. Please indicate the number of years you have worked at Aveda as an Aveda employee:

- Less than 1 year
- 1 – 5 years
- More than 5 years

2. Prior to becoming an Aveda employee, please indicate the number of years you worked for a contract company at the Aveda facility:

- Less than 1 year
- 1 – 5 years
- More than 5 years

3. Please indicate the area you primarily work in at the present time:

- Aroma Compounding
- Assembly/Filling
- Chemical Receiving
- Component Receiving
- Compounding
- Facilities
- Production Maintenance
- Shipping
- Storage and Warehouse

4. Please indicate which of the following teams you are a member of:

- First Aid Responder Team
- Spill Response Team
- Fork Truck Operator

Appendix C

Summary of ANSI Z490 Evaluation Approaches Outlined in the Standard.

ANSI Evaluation Approach	Definition	Suggested Methods
Reaction survey	Subjective evaluation of the training course by trainees	Trainers presentation skills, accommodations, pace, usefulness
Evaluation of knowledge, skills and abilities	Tools used to evaluate knowledge skills, and abilities.	Tools that may be administered as pre and post tests only or self administered evaluations that may include: written tests, oral examination, project completion, skill demonstration (in simulated or actual work setting)
Observation of performance		Pre and or post data that included performance information collected from supervisors, co-workers or customers and or productions and safety reports.
Organizational results	Key business measures	Increased in safe behaviors and implemented preventative measures and controls, reduced near hits, injuries, illnesses and workers compensation claims, improved environmental compliance and higher ROI.