WAUSAU/MOSINEE PAPERS WELD TRAINING

RHINELANDER, WISCONSIN

by

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A Research Paper

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ABSTRACT

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APA Style Manual Used In This Study
(Name of Style Manual Used in this Study)

Rhinelander Papers is a paper mill that makes wax coated paper used in candy wrappers. The plant has been in Rhinelander for many years, but Wausau/Mosinee Papers purchased it from another company in 1993. Like many new companies, Wausau/Mosinee Papers brought in new management and new ways of doing things. This has caused some confusion and lack of trust from the employees regarding management. This new job classification called 'Mectech' is one of the changes that has caused some welders to not trust management. They feel management is stepping on their turf by training other trade employees to do their work. This has also caused hard

feelings between the welders and other trade employees in the plant. The main reason the new classification was created was to reduce the down time caused by waiting for welders to do small welding jobs other trade employees could do themselves with proper training. The Human Resource Manager (HRM) at Wausau/Mosinee Papers called Nicolet Area Technical College (NATC) to set up a weld training program. A contract will be written to do a two day needs assessment. From the needs assessment, training requirements, numbers of students, and costs will be determined.

After the information has been compiled and all the questions have been answered, a meeting will be scheduled with the HRM at Wausau/Mosinee Papers to get his approval or make modifications as needed. After we agree on the project proposal, a new contract will be agreed upon between Wausau/Mosinee Papers and NATC. At that time, a course will be developed based on the needs identified from the needs assessment.

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Chapter I
Research Problem and Objectives

American businesses face increasing foreign competition from the Pacific Rim and an unified European economic community with declining rates of productivity growth, eroding public confidence in product or service quality, advancing technology and shifting social attitudes about work and organization loyalty. Many managers are eager to take whatever steps they can to meet these challenges (Rothwell and Kazanas 1992).

Rhinelander is a small community in northern Wisconsin that has attracted many new businesses over the last ten years. Its main industries for many decades were tourism and logging. The Rhinelander Paper Mill was the largest employer for many years. They had a good product and loyal customers, but the cost to produce the paper was increasing.

The managers and employees were reluctant to make changes to improve productivity and started to lose many of the loyal customers. They could not recover fast enough and had to sell to Wausau/Mosinee Papers. The new managers believe in the work of Demming, Peters, Swanson, Kazanas, Rothwell, and others. They believe in a systematic approach to change; quality training is the key to staying competitive.

This paper will focus on a partnership between

Wausau/Mosinee Papers and Nicolet Area Technical College (NATC) welding department to improve productivity and cost effectiveness.

Statement of the Problem

A new job classification created at Wausau/Mosinee Papers Corporation in Rhinelander, Wisconsin allows the electricians, machinists, millwrights, pipe fitters, and sheet metal workers to do non-critical welding in their fields of expertise without having a certified welder do a simple welding job. The problem is to develop a weld training program that addresses the needs of the employees with little or no training in welding and take them to a level of welding skill that produces good welds using various welding and cutting processes.

Research Objectives

The objectives for this study are:

1. To identify what welding processes are used by the various trade employees.
2. To identify the level of importance employees place on welding skills they need to perform their job.
3. To deliver training that meets the needs of the employee and employer.

4. To develop a partnership between Wausau/Mosinee Papers and NATC for future training needs.

Need For The Study

Wausau/Mosinee Papers Corporation like many companies across the country are investing more time and money into the training of their employees. Wausau/Mosinee Papers commitment to improving employee skills and reducing the down time of paper machines created a new job classification at the mill. The 'Mectech' classification allows the electricians,

machinists, millwrights, pipe fitters, and sheet metal workers, to do non-critical welding in their area of expertise/trade without having to call a welder in to do a simple welding job. For example: this new job classification would allow a pipe fitter to weld a bracket on an existing frame or structure to locate a pipe. Another example would be a sheet metal worker makes some exhaust duct work and a bracket needs to be welded to it for installation. Prior to the new classification, the pipe fitters and other trade employees would have to wait for a welder to perform the job. Because of the limited number of welders and job requirements they have, this wait could take hours. If the job needed to be done on a weekend or holiday, the welder on call duty would have to come in to make the welds. The union contract

requires the company to pay a minimum of five hours for call time. Many of the jobs the welders do for other trade employees takes 15-20 minutes. This costs the company a lot of time and money. An agreement was made between labor and management to adapt the Mectech classification and require a minimum of 100 hours of weld training to qualify for the new classification. A job posting was put on the bulletin board and six employees signed up for the training.

Wausau/Mosinee Papers feel this new classification and training will reduce the down time due to welding related problems by 5% over the next year. The Human Resource Manager (HRM) at Wausau/Mosinee Papers contacted NATC Welding Department to set up a weld training program based on their needs.

This researcher is currently employed by NATC as the welding instructor. The role of the welding instructor at

NATC is to deliver weld training to students enrolled in the one year welding diploma program and help local employers with weld training needs. It will be the responsibility of this researcher to develop and deliver a weld training program that addresses the needs of the company.

Definition of Terms

For the purpose of the study and so terms used would be more easily understood, the following definitions were

applied as defined by HRM at Wausau/Mosinee Papers:

Trade employees. Employees that have finished or are in the process of completing a 4 or 5 year state apprenticeship program in one of the following areas: electrician, machinist, millwright, pipe fitter, sheet metal worker, or welder.

Mectech. New classification that after training allows employees to do non-critical welding in their trade without having to call a certified welder in to do the job. This would include electricians, machinists, millwrights, pipe fitters, and sheet metal workers.

Electricians. Employees that install wiring to all new machines and repair all electrical problems at the mill.

Machinist. Employees that operate machine tools to make or repair gears, shafts, pulleys, sprockets, or any parts that require close tolerance ability.

Millwrights. Employees that set-up and maintain all the machines at the mill.

Pipe fitters. Employees that set-up and maintain all the plumbing at the mill.

Sheet metal workers. Employees that fabricate air ducts, safety covers, or anything that requires the use of very thin metal.

Welders. Employees that do welding on structural buildings and pipe that carry chemicals under pressure. These employees must take a state certified welding test every three years to demonstrate welding ability.

Nicolet Area Technical College (NATC). A two year community college that offers education in many fields of study to citizens of northern Wisconsin.

Limitation of the Study

The study will be limited to the six employees that signed up for the Mectech classification and training. They come from the pipe fitters trade. They have been with the company from 7 to 23 years and have a wide range of experience. The 100 hours of training may limit the development of welding skills of those employees with no prior welding training. Other trade areas that may be affected by the study include: electricians, machinists, millwrights, and sheet metal workers.

The survey will be administered to the six employees by the Wausau/Mosinee Paper HRM and may not reflect all the needs of the employees.

Assumptions

The following factors will affect Wausau/Mosinee Papers after the 100 hour training:

1. Employees will use the new skills to shorten down time.

2. Supervisors will monitor the Mectech request for weld assistance to ensure welders are not doing non-critical

welding Mectechs were trained to do. If this is not

monitored, it will cost the company more money because the Mectech is paid at a higher hourly rate.

Summary

The paper making industry is very competitive with a high cost of maintenance. In order to survive in the industry Wausau/Mosinee Papers Corporation must reduce down time costs, improve employee skills, and identify other areas of training needs. This study will help Wausau/Mosinee Papers Corporation attain their goal.

Chapter II
Review of Literature

The success of today's organization is dependent on the skills of its employees. Many paper mills across the United States have created a multi skill job classification that

requires cross training of the trade employees in various skill processes. The training process whether it be for welding or any other occupation is defined as the systematic acquisition of skills, rules, concepts, or attitudes that result in improved performance in the work environment (Schneier, 1994). No human enterprise can succeed without skillful and knowledgeable human resources. Thus, to ensure its success, an organization must address the training and development needs of its employees (Wiley, 1993). The major training needs of Wausau/Mosinee Papers will be the focus of this study which will include welding processes, safety procedures, level of training, and how the training will be designed/delivered.

Welding Processes

The number of different welding processes has grown in recent years. These processes differ greatly in the manner in which heat and pressure are applied and in the type of equipment used (Jeffus, 1999).

Jeffus, (1999) defined the welding process as:

> A joining process that produces coalescence of materials by heating them to the welding temperature, with or without the application of pressure or by the application on pressure along, and with or without the use of filler metal. (p. 4)

The welding processes used at Wausau/Mosinee Papers that will be focused on in this study include:

A. SMAW - Shielded Metal Arc Welding

B. GMAW - Gas Metal Arc Welding

C. GTAW - Gas Tungsten Arc Welding

D. OFC - Oxyfuel Gas Cutting

E. PAC - Plasma Arc Cutting

Shielded Metal Arc Welding

Shielded metal arc welding (SMAW) is sometimes referred to as arc or stick welding. This welding process uses a flux covered metal electrode to carry an electrical current and is the most widely used welding process because of its low cost, flexibility, portability, and versatility (Jeffus, 1999)

Gas Metal Arc Welding

Gas metal arc welding (GMAW) is sometimes referred to as MIG was developed and became commercially available in 1948. The process uses a role of solid wire, wire feeder, inert gas, and a power source to produce excellent welds in one third the time of shielded metal arc welding (Jeffus, 1999).

Gas Tungsten Welding

Gas tungsten arc welding (GTAW) is sometimes referred to as TIG welding which stands for tungsten inert gas welding. The TIG process was developed in the later 1930's and early 1940's. In this process, an arc is established between a tungsten electrode and the work. The electrode does not melt, but at the point of the tungsten the arc melts the base metal and then wire is fed into the molten weld pool by hand (Jeffus, 1999).

Oxyfuel Gas Cutting

Oxyfuel gas cutting (OFC) is sometimes referred to as oxy-acetylene cutting. This process uses a high temperature oxygen acetylene gas flame to preheat the metal to a kindling temperature. After the kindling temperature is reached, a jet of pure oxygen is injected into the flame. The oxygen oxidizes the metal and the cut is made. More people use the

oxyfuel cutting process than any other cutting process (Jeffus, 1999).

Plasma Arc Cutting

Plasma arc cutting (PAC) was developed in the mid 1950's. A plasma results when a gas is heated to a high enough temperature to convert it into positive and negative ions,

neutral atoms, and negative electrons. The temperature of a concentrated arc is about 43,000 degrees fahrenheit which is hot enough to rapidly melt any metal it comes in contact with (Jeffus, 1999).

Safety Procedures

Welding like other heavy industrial jobs, has a number of potential safety hazards. These hazards need not result in anyone being injured. Learning to work safely with these hazards is as important as learning to be a skilled welder (Jeffus, 1999).

Levels of Training

Training will be based on the American Welding Society (AWS) entry level skills standard for welders. The basic requirements contained in the document were established as a result of individuals from a broad range of businesses, job classifications, and industrial or education areas participating in a national survey to identify entry level welder skills (AWS QC 10-95). This information was analyzed by AWS and other subject matter experts. Models were designed from the research that addresses the skill requirements of

entry level welders. Refer to Appendix A - seven (7) pages.

Design of Training

Research in the design and analysis of training needs have produced many models for designing effective training. Traditionally most models include five phases of training. They include: analyze, design, develop, implement, and evaluate. There may be some variation in wording and the level of information analyzed in each phase of various models, but they are a systematic way to design training. Two models used in this review include: Training for Performance Systems (TPS) (Swanson, 1996) and Instruction Design Process (Rothwell and Kazanas, 1992) as indexed in Appendix B - two (2) pages of this report.

Instructional design is associated with analyzing employee performance problems in a systematic way, identifying the root cause(s) of the problem, considering various solutions to address the root cause(s), and implementing the solution in ways designed to minimize the unintended consequences of corrective action (Rothwell and Kazanas, 1992).

First step: Needs assessment

This is the most important step in the system. In this phase, you must determine what the problem is and if training is the appropriate solution. During this phase, goals and objectives are determined and resources such as time,

personnel, and money are considered. Surveys and interviews may also be used to gather important information you can use

to determine what the needs of the company are. It is very important that this information is gathered from all departments, because what you do in one department may affect other departments.

Second step: Job, task, content analysis

In this step, you sort out the data and answer these questions. 1. What is happening? 2. What should be happening? 3. Why does the problem exist? 4. What are the effects of the problem? 5. Is the problem a training or non-training issue? When you have answers to these questions, the next phase will be easier to do.

Job analysis is important because it identifies what people do or should do and thereby provides information for selecting, appraising, compensating, training, and disciplining employees (Rothwell and Kazanas, 1992).

A task analysis is an intensive examination of how people perform work activities. It can sometimes involve a critique and reexamination of work activities as well. Task analysis is carried out to (1) determine components of competent performance; (2) identify activities that may be simplified or otherwise improved; (3) determine precisely what a worker must know, do, or feel to learn a specific work activity; (4)

clarify conditions (equipment and other resources) needed for competent performance; and (5) establish minimum expectations (standards) for how well job incumbents should perform each task appearing in their job description(s) (Rothwell and Kazanas, 1992).

Content analysis, sometimes called subject matter analysis, is intended (1) to identify and isolate single idea

or skill units for instruction; (2) to act as an objective decision rule for including or excluding topics from instruction; and (3) to provide guidance to sequence topics in instruction (Rothwell and Kazanas, 1992).

Third step: Design

In this step, you convert information gathered into a desired performance objective or results needed from training, to develop performance measurements and sequence performance objectives.

In the development of performance objectives you must answer these questions: 1. What is the purpose of this training? There are four choices: A. Increasing knowledge, B. Changing attitudes or feelings, C. Building skills, D. Combination of the above. 2. What kind of knowledge, feeling or skill instruction is necessary to instruct people to perform this task or demonstrate this knowledge? 3. What knowledge do learners need before participating in this

training?

In the development of performance measurements you must answer two basic questions. 1. What should be measured? 2. How should it be measured? From this information, you can develop: tests, performance checklists, written assignments, etc. to measure learning.

The last part of the design/development step is organizing the performance objectives into the sequence in which they will be taught to trainees. Learning should be sequenced so learners will be systematically introduced to work activities in ways appropriate to the performance objectives.

In his book **Elevators: How To Move Training Up From The**

Basement, Noonan (1994) stated,

> Don't reinvent things. Use vendor programs when you can and if you can't, then use outside folks to create the courses you need. (p. 38)

There are many organizations to obtain materials from with expertise in various areas. A list with addresses and phone numbers are located in Appendix C.

Fourth step: Implementation

In this step, the materials used in training are developed or modified, course outlines are prepared, and learning activities are developed. In the implementation of training programs you must answer these questions: 1. Who

will deliver the training? Use pros whenever you can. The more time you spend in a classroom, the less effective you are as a training manager (Noonan, 1994). 2. What type of media will be used? Examples would be: books, computers, films, videotapes, job aids, etc. (Rothwell and Kazanas, 1992) 3. What constraints on time, equipment, staff skills, and costs affect the planned learning experience? 4. What mode will be used?

There are four basic mode types. 1. Mass instruction involving many learners. 2. Group instruction involving fewer learners. 3. Individualized instruction involving only one learner at a time. 4. Direct experience involving real time learning such as informal on the job training. When choosing a delivery mode, always consider constraints and management/worker preferences.

The fifth and last step: Evaluation of Instruction

In this step, you develop an evaluation plan which will

determine the quality of the training presented. There are four levels to consider in evaluation of training programs. Each level gets harder to do, but gives you better data.

Level 1: Acceptance

Level one asks, did the students like the course? This is usually done with an end-of-course survey form. It gives

limited data, but less costly if you have limited training funds (Noonan, 1994).

Level 2: Learning

This level asks, what was learned in the course? Can students do something now that they could not do before the training took place? This is usually done with pre and post tests or a post test only. This will get you higher up the evaluation elevator, but is tied to training events and not impact the organization (Noonan, 1994).

Level 3: Transfer

Level three asks, are students applying what they learned to their jobs? This is done with follow-up surveys of students and supervisors or on-the-job observations. With this data you are taking the evaluation out of the training event and showing some impact on the organization (Noonan, 1994).

Level 4: Results

This level asks, what is the impact of the change in behavior on the job for example: are sales up, costs down,

cycle time reduced, is time saved? This is done by looking at actual job performance and productivity. With this data, you

are talking dollars, bottom line, cost savings, which is the language of business (Noonan, 1994).

Conclusion

The instructional design process model is the most important tool a training manager has in solving performance problems. If the model is applied properly, it will improve performance in any company by answering two questions: 1. Are we doing things right? This is addressing "efficiency". 2. Are we doing the right things? This is addressing "effectiveness".

Concerns Related to the Research

The information reviewed by this researcher addresses the needs of entry level welders, but may not address all the needs of the employees of Wausau/Mosinee Papers. For this reason, more research will be needed at the Wausau/Mosinee Papers plant to validate or adapt the model listed in Appendix A.

Summary

The training program for Wausau/Mosinee Papers will be individualized and focus on the needs of each trade person. The research reviewed in this chapter will aid this researcher

in the development of training programs that are effective and may be used at other mills around the country.

Chapter III
Research Methods

The purpose of this field problem study is to develop, deliver, and evaluate a weld training program that addresses the welding needs of the Mectech electricians, machinists, millwrights, pipe fitters, and sheet metal workers at

Wausau/Mosinee Papers in Rhinelander, Wisconsin.

This chapter discusses the research methods that will be utilized in this descriptive field problem study. Information on the research design, population selection, instrumentation procedures, limitations, and data analysis methods are also described and highlighted in this chapter.

Research Design

A descriptive research design (survey instrument) was chosen for this field problem study. It was selected because the purpose of this study was to determine how much and what type of weld training is required by the trades employees at Wausau/Mosinee Papers.

Population Selection

The population of this study was the six volunteers of trade employees at Wausau/Mosinee Papers. This group, all male consisted of six pipe fitters.

Instrumentation

Two written surveys were developed. The first survey was printed on five sheets of paper. The first sheet was a cover letter describing the study. The actual survey covered four pages. Respondents were asked to identify important attributes of welding used in their trade based on a four (4) point Likert Scale (Very Important.... Not Important). The questions contained in the survey were designed to gain information from the employees about what they perceived as key elements in welding that are essential for them to perform their job.

Information gathered from the survey was used to develop a training syllabus and curriculum to be used at Nicolet Area Technical College (NATC) by the researcher in the delivery of the training. A copy of the survey is located in Appendix D - four (4) pages.

A thank you letter was sent to all respondents with the results of the survey. A copy of the letter is located in Appendix E.

The second survey was developed to evaluate the training program. This survey was based on a five (5) point Likert Scale (Excellent....Poor) and included four open ended questions. A copy of the survey is located in Appendix F.

Procedures

The first survey was distributed through plant mail at Wausau/Mosinee Papers by the researcher. Six surveys were delivered to respondents on June 26, 2001. The surveys were returned to the Human Resource Management (HRM) Office through plant mail ensuring anonymous responses. All six surveys were returned to the researcher by June 29 due date.

One hundred hours of training were given to six employees of Wausau/Mosinee Papers by this researcher at (NATC) on July 9-25. The training consisted of classroom and hands-on welding exercises that were identified in the survey.

The second training evaluation survey was hand delivered to the trainees by the researcher at the end of the training. It was collected by one of the trainees and returned to the researcher in an envelope.

Limitations

The study is being conducted with only six trade

employees at one paper mill. While the results will assist Wausau/Mosinee Papers in developing the requirements for the new job classification, they may not reflect all the training needs. Due to the small number trained, the requirements for Wausau/Mosinee Papers may not be applicable to similar requirements for the job classification at other paper mills due to the nature of the paper industry.

Data Analysis

The data collected from the surveys were analyzed using descriptive statistics which included: interview studies, questionnaires, frequency counts, and percentages for all items on the evaluation form. This data was analyzed and validated by the HRM, managers and employees from Wausau/Mosinee Papers, and this researcher to determine what training needs to focus on in this training session as well as identify future training needs.

Decision Table

A decision table was created to aid in identifying training needs based on the information gathered from the survey. The decision to use or reject that information on each questions was based on the following table.

Level of importance:

3.1 - 4.0 = Accept

1.51 - 3.0 = Questionable

1.0 - 1.50 = Reject

Research Activities and Schedule

This researcher has spent thirty years in the welding industry. This knowledge, along with the information gathered

in the literature review was used to form the basic elements

of the surveys.

Table 3-1
Research activity and time schedule:

1.	WMP contacts NATC with a training need	June 4
2.	Conduct needs assessment with HR at WMP	June 11-12
3.	Conduct literature review	June 12-15
4.	Develop survey	June 15-18
5.	Validate survey instrument with WMP manager	June 19
6.	Administer survey	June 26-29
7.	Analyze data	July 1-3
8.	Develop syllabus and curriculum	July 1-8
9.	Deliver training	July 9-25
10.	Write report	June 26-August 3

Project Staff

This researcher will be the only staff member involved and will conduct all of the above activities. The resume of this researcher can be found in Appendix G - 2 pages.

Evaluation

The process has been evaluated through the researcher's ability to complete the activities within the time frame described in order to meet the objectives of the study. These objectives are directly related to the full time function of

the researcher. The final report must conform to the standards of the University of Wisconsin-Stout Graduate School.

The objectives for the study are:

1. To identify what welding processes are used by the various trade employees at Wausau/Mosinee Papers.

2. To identify the level of training required to perform the welding jobs they may encounter.

3. To deliver training that meets the needs of the employees and employer.

4. To develop a partnership between WMP and NATC for future training needs.

A quantitative analysis of the first survey will provide an evaluation of the first and second objectives. A table listing the importance of each survey item will be presented to explain employee perceptions on training needs.

A quantitative analysis on the second survey will provide evaluations of the third and fourth objectives. A table listing the satisfaction level of each survey item will be presented to explain employees perceptions of the training.

A quantitative analysis will also be done on the second survey. The survey provides an opportunity for respondents to describe 'other' issues in the comment section. The analysis of this information will be especially helpful in meeting the fourth objective: develop a partnership between Wausau/Mosinee Papers and NATC for future training needs.

Chapter IV
Results

Wausau/Mosinee Papers Weld Training Survey Results

This evaluation focused on the needs of the employees with regards to skill required to perform their job. Survey questions are listed along with the mean average of

respondents who marked very important to not important on each item. See Table 4.1. Respondents answered all questions on the survey.

Table 4.1
Summary of employee responses indicating levels of importance to survey questions.

Number = 6

Wausau/Mosinee Papers
Weld Training Survey Results

		Very Important			Not Important	Mean Average
		4	3	2	1	
A.	**Safety**					
	Identify basic hygiene	4	3	2	1	3.3
	Read MS/DS	4	3	2	1	3.5
	Locate safety equipment	4	3	2	1	3.3
	Use lockout and tag out procedures	4	3	2	1	2.67
	Use safe lifting techniques	4	3	2	1	3.3
	Use hand tools safely	4	3	2	1	3.17
	Demonstrate good work habits	4	3	2	1	3.17
	Use rigging and hand signals	4	3	2	1	1.83
	Drive fork lift	4	3	2	1	2.3

B.	**Identify metals and material**					
	Identify carbon steel	4	3	2	1	3.0
	Identify stainless steel	4	3	2	1	3.17
	Identify aluminum materials	4	3	2	1	1.83
	Identify cast iron	4	3	2	1	2.7
	Identify cracks and defects	4	3	2	1	3.17
C.	**Oxy-acetylene welding/cutting**					
	Perform safety procedures	4	3	2	1	3.67
	Prepare metal	4	3	2	1	2.67
	Weld with torch - "flat position"	4	3	2	1	1.5
	Cut metal	4	3	2	1	3.67
	Braze weld	4	3	2	1	1.5
	Solder weld	4	3	2	1	1.0
	Heat and bend steel	4	3	2	1	3.17
	Gouge heavy steel	4	3	2	1	1.5
D.	**Arc Welding**					
	Determine weld type and size	4	3	2	1	2.67
	Prepare metal: cast iron, stainless, carbon steel, aluminum, cast magnesium	4	3	2	1	3.17
	Set-up welder, rod, angle, size, techniques	4	3	2	1	3.5
	Weld flat and horizontal					

fillet	4	3	2	1	3.0
Perform groove weld: flat and horizontal	4	3	2	1	3.17
Perform vertical up weld	4	3	2	1	2.5
Perform vertical down weld	4	3	2	1	2.5
Perform overhead weld	4	3	2	1	2.3
Perform pipe 6-G weld	4	3	2	1	2.17
Gouge heavy steel	4	3	2	1	1.5
Pass certification exam	4	3	2	1	2.17
E. MIG Welding					
Determine weld type and size	4	3	2	1	3.0
Prepare metal: cast iron, stainless, carbon steel, aluminum, cast magnesium	4	3	2	1	3.17
Set-up welder, rod, angle, size, techniques	4	3	2	1	3.5
Weld flat and horizontal fillet	4	3	2	1	3.67
Perform groove weld: flat and horizontal	4	3	2	1	3.17
Perform vertical up weld	4	3	2	1	2.67
Perform vertical down weld	4	3	2	1	2.5
Perform overhead weld	4	3	2	1	2.17

Perform pipe 6-G weld	4	3	2	1	2.17
Gouge heavy steel	4	3	2	1	1.33
Pass certification exam	4	3	2	1	2.5
F. TIG Welding					
Determine weld type and size	4	3	2	1	2.83
Prepare metal: cast iron, stainless, carbon steel, aluminum, cast magnesium	4	3	2	1	2.83
Set-up welder, rod, angle, size, techniques	4	3	2	1	3.5
Weld flat and horizontal fillet	4	3	2	1	3.3
Perform groove weld: flat and horizontal	4	3	2	1	3.3
Perform vertical up weld	4	3	2	1	2.5
Perform vertical down weld	4	3	2	1	2.0
Perform overhead weld	4	3	2	1	1.83
Perform pipe 6-G weld	4	3	2	1	1.5
Gouge heavy steel	4	3	2	1	1.0
Pass certification exam	4	3	2	1	1.83
G. Quality					
Follow quality procedures	4	3	2	1	3.17
Visually inspect weld and product	4	3	2	1	2.5
Bend test	4	3	2	1	1.67
Use inspection tools: fillet gauges, gap gauges, weld gauges, etc.	4	3	2	1	1.83
PT	4	3	2	1	1.33
MT	4	3	2	1	1.5
VT	4	3	2	1	1.5
RT	4	3	2	1	1.33
HT	4	3	2	1	1.33
H. Blueprint Reading					
Read basic blueprints:					

	format, title block, update notes	4	3	2	1	2.83
	Recognize line types	4	3	2	1	2.17
	Read and interpret blueprint symbols	4	3	2	1	2.83
	Read and interpret welding symbols	4	3	2	1	3.17
	Interpret orthographic projections	4	3	2	1	2.5
	Interpret section views and cutaways	4	3	2	1	2.17
	Sketch parts	4	3	2	1	1.83
	Use shop print	4	3	2	1	2.67
		28				
I.	**Fabricating**					
	Use grinder	4	3	2	1	3.67
	Use bandsaws	4	3	2	1	3.0
	Use shears	4	3	2	1	3.3
	Use ironworker	4	3	2	1	2.83
	Use hand brake	4	3	2	1	2.0
	Use roller	4	3	2	1	1.67
	Use drill press	4	3	2	1	2.83
	Tack weld	4	3	2	1	3.0
J.	**Math**					
	Do lineal measurement	4	3	2	1	3.3
	Convert fractions to decimals	4	3	2	1	3.17
	Use hand calculator	4	3	2	1	3.3
	Add and subtract decimals and fractions	4	3	2	1	2.83
	Convert inches to degrees	4	3	2	1	1.83
	Multiply and divide fractions and decimals	4	3	2	1	2.83
	Convert metric to english and back	4	3	2	1	2.33
K.	**Communications**					
	Use active listening skills	4	3	2	1	2.5
	Follow a written procedure	4	3	2	1	2.33
	Follow verbal instructions	4	3	2	1	2.83
	Complete and file documentation	4	3	2	1	2.17
	Write a progress report	4	3	2	1	2.17
	Complete requisition forms	4	3	2	1	1.83
	Make oral presentations - small group	4	3	2	1	1.5
L.	**Human Relations**					
	Interact effectively with customers	4	3	2	1	1.33
	Work effectively with supervisor	4	3	2	1	2.5
	Accept diversity in the workplace	4	3	2	1	2.0
	Actively participate in a team approach	4	3	2	1	2.3
	Accept change	4	3	2	1	2.0

Table 4.2

Based on the information gathered from the survey, the decision to use or reject the information gathered on each question will be based on the following table.

Decision Table

Level of Importance

3.10 - 4.00 = Accept

1.51 - 3.00 = Questionable

1.00 - 1.50 = Reject

This survey indicated a number of areas employees regard as very important skills to have in performing their job. The focus of this training is welding skills, therefore non-welding areas of training will be addressed in future training programs. They include: quality, blueprint reading, fabrication, math, communication, and human relations.

Weld Training Needs

Employee responses to weld training survey questions indicated a need for weld training in the following areas: oxy-acetylene, welding/ cutting, arc welding, MIG welding, and TIG welding. This need was identified using Decision Table 4.2

Oxy-Acetylene Welding/Cutting

Four skill areas in this process were identified based on the survey results. See Table 4.1 and the Decision Table 4.2.

They include: perform safety procedures (3.67), cut metal (3.67), heat and bend steel (3.17), and questionable response for prepare metal (2.67).

Arc Welding

All areas of arc welding except gouge heavy steel (1.5) were indicated as needing training. See Table 4.1 and 4.2.

MIG Welding

All areas of MIG welding except gouge heavy steel (1.33) were indicated as needing training. See Table 4.1 and 4.2.

TIG Welding

All areas of TIG welding except perform pipe 6-G weld (1.5) and gouge heavy steel (1.0) were indicated as needing training. See Table 4.1 and 4.2.

Summary of Training Needs Survey

This survey identified a number of welding skills employees feel are important for a Mectech to perform their

job. The skill levels in welding employees had before training were not addressed in this survey. The Mectech classification requires a minimum of 100 hours of documented weld training regardless of skill level.

Results from the training needs survey were reviewed by Human Resource Manager (HRM), supervisors, employees, and this researcher. After review a decision was made to focus this training on oxy-acetylene cutting and arc welding. The main reason for this decision is that equipment to perform this

welding and cutting is available in all areas of the plant. Other weld training need will be addressed in future training programs.

Customized Training Evaluation

This evaluation focused on the satisfaction of the employees with regard to the training and instructor's ability. Survey questions are listed along with the percentage of respondents who marked excellent to poor on each item. See Table 4.3.

Respondents answered all the questions on the survey. A zero percentage indicates the percentage of respondents who did not mark any response to that item.

Table 4.3
Summary of employee responses indicating level of satisfaction to survey questions.

Number = 6

Nicolet Area Technical College
Customized Training Evaluation Results

	Excellent (5)	Good (4)	Fair (3)	Poor (2)	N/A
Training					
1. Your overall rating of training	33.3	66.7	0	0	
2. Usefulness of training activities to your job	50.0	50.0	0	0	
3. The content of the training	50.0	33.3	16.7	0	
4. Time allotted	16.7	16.7	33.3	33.3	
5. The appropriateness of text-book, handout materials, audio visuals	33.3	66.7	16.7	0	0
6. Assignment and evaluations	16.7	66.7	16.7	0	0

7. Day and time of training	16.7	33.3	16.7	33.3
8. Location of training	50.0	50.0	0	0
Instructor or Technician				
9. Effectiveness of instructor/ technician	66.7	33.3	0	0
10. Knowledge of instructor/ technician	66.7	33.3	0	0
11. Preparedness and organization of instructor/technician	16.7	83.3	0	0
12. Instructor/technician was easy to understand	66.7	33.3	0	0
13. Instructor was patient and open to questions	83.3	16.7	0	0
14. The instructor/technician met your overall expectations	50.0	50.0	0	0

Training Satisfaction

The level of satisfaction the employees experienced from the training was described in several survey questions. Respondents reported high levels of satisfaction related to overall training, usefulness, and location.

Two questions that dealt with time indicated respondents satisfaction was much lower. See figure 4.4 and 4.5.

Time Allotted

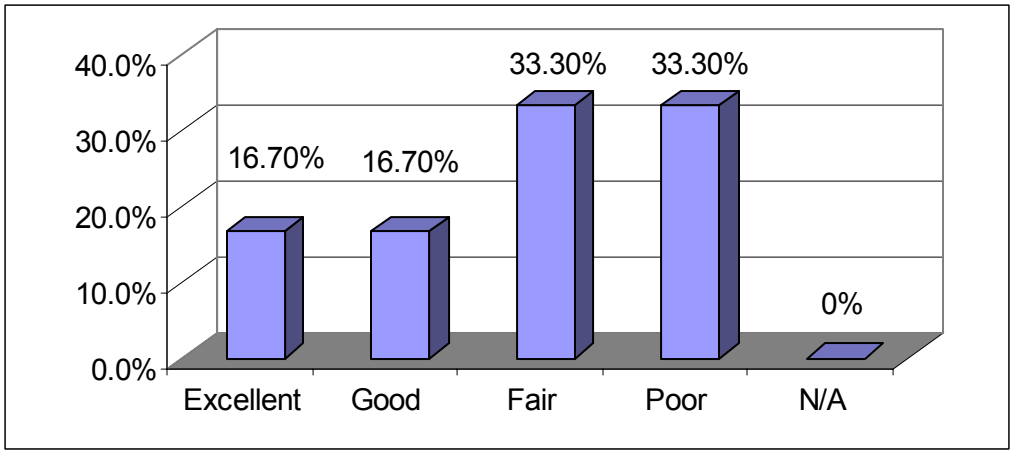

Figure 4.4 Employee responses to survey item: "time allotted" number 4. Responses are based on a percentage of respondents indicating excellent, good, fair, poor, and N/A.

Day and Time of Training

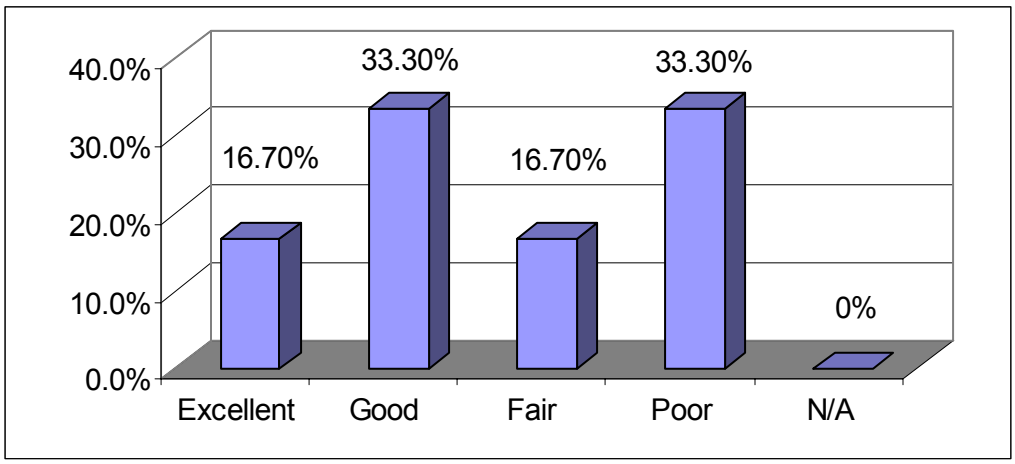

Figure 4.5 Employee responses to survey item: "day and time of training" number 7. Responses are based on a percentage of respondents indicating excellent, good, fair, poor, and N/A.

Instructor or technician satisfaction

The level of satisfaction the employees experienced from the instructor was described in several survey questions. Respondents reported high levels of satisfaction in all areas related to instructor or technician (100% in the excellent to good range.)

Organization

One question on the survey that dealt with organization of instructor/technician received a high percentage in the good range.

35

Preparedness and Organization

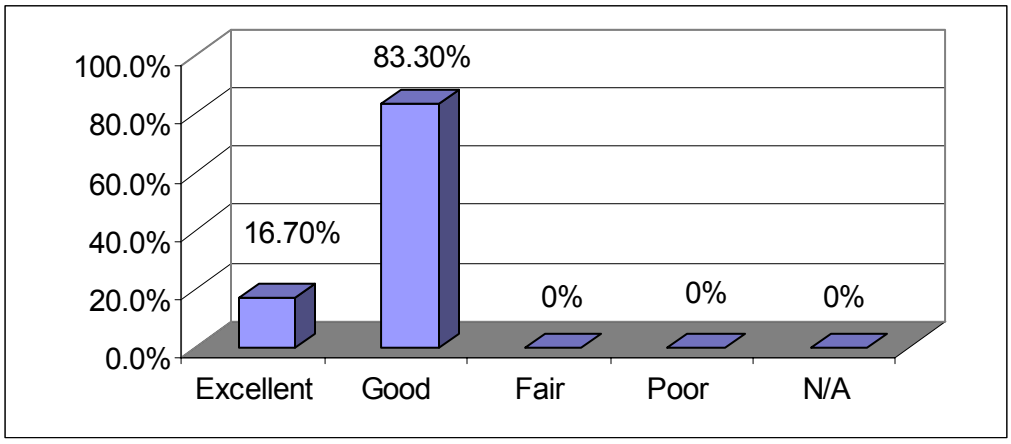

Figure 4.6 Employee responses to survey item: "preparedness and organization of instructor/technician" number 11. Responses are based on a percentage of respondents indicating excellent, good, fair, poor, and N/A.

Summary of Comments Section in Training Evaluation

The comments section of the survey asked respondents to (1) indicate what the strengths of training were, (2) what aspect of the training needs improvement, (3) what other training is of interest to you, and (4) addition comments.

Comments relating to the strengths of training were "hands on learning", "good course for all skill levels", "able

to work at my own pace", and "training away from work (no interruptions)".

Comments relating to improvements needed included: "more time", and "more advanced notice of training".

Comments relating to other training needed were: "GMAW", "GTAW", "blueprint reading", "safety", "forklift", and "all types of training".

No one responded to the last question - additional comments.

Summary of Chapter

The two surveys produced a great deal of information to address the training needs and evaluation of the training, but may be limited in scope.

Caution

There was only one group of employees, pipe fitters, who answered the surveys and received the training. For this reason, training needs of other trade employees may not be met. Surveys given to other trade employees and comparisons made between groups would be more reliable.

Chapter V
Summary, Conclusions, and Recommendations

At Wausau/Mosinee Papers, a new job classification called Mectech was created to allow electricians, machinists,

millwrights, pipe fitters, and sheet metal workers to perform non-critical welding that would normally be done by certified welders. Many hours of down time were caused by trade employees waiting for welders to do a ten minute job. Wausau/Mosinee Papers and the local union agreed to the new classification which included a minimum of 100 hours of documented weld training. With this new classification and training, Wausau/Mosinee Paper's goal is to reduce down time by 5%. Wausau/Mosinee Papers contacted Nicolet Area Technical College (NATC) to perform the training based on the needs of the employees.

Two surveys were administered to six employees, all pipe fitters at Wausau/Mosinee Papers. The first survey gathered data on welding and other skills employees need to perform their job. The survey was based on a four point Likert Scale ranging from very important to not important. The second survey gathered data on the effectiveness of the training. This survey was based on a five point Likert Scale ranging from excellent to poor.

Conclusions

The first objective of the study was to identify what welding processes are used by the various trade employees. Several questions in the first survey identified three welding and one cutting process employees needed trading in. Two were focused on in this training program: arc welding, and oxy-acetylene cutting.

The second objective was to identify the level of training required to perform the welding jobs they may encounter. All questions on the survey relating to welding and cutting with an average of 2.3 or higher were addressed.

The third objective was to deliver training that met the needs of the employer and employees. The second survey indicated employers were very happy with the content and delivery of the training, but questions related to time allotted and day and time of training received lower satisfaction. This will be addressed in future training programs. One question, preparedness and organization of instructor caught this researcher's attention. The high level of responses in the good range 83.3 indicated employees felt this researcher could have been more organized. This could have been caused by this researcher doing the training and research for this paper at the same time.

The fourth objective was to develop a partnership between Wausau/Mosinee Papers and NATC for future training needs.

This first survey identified many training needs that NATC could provide to establish a good partnership with Wausau/Mosinee Papers.

Recommendations

The limited number of employees in this survey may not reflect the needs, skill levels, and types of weld training required for a Mectech to perform their job. A needs survey given to all trade employees and comparison made of data gathered would give more accurate information.

The hours of training and time should be addressed in future training programs. The welding skills identified in the weld training survey were not able to be met by all trainees because of time constraints. If arc welding, oxy-acetylene cutting, and 100 hours of training are the minimum requirement for a Mectech, then the minimum training time

should be increased by at least 25 hours to allow everyone to attain basic skill levels. These skills will be lost if not practiced on a regular basis. Therefore, time should be allowed for them to practice whenever possible. Short one day refresher classes would also help maintain and improve their skills.

Other training needs identified in the survey should be addressed to improve effectiveness of Mectechs and help reduce down time.

Records need to be kept by supervisors of the number of requests made by Mectechs for certified welders to ensure they are doing the extra work they were trained in and getting paid for. With this information, Wausau/Mosinee Papers will be able to tell if the new Mectech classification is working to reduce down time cost.

As Wausau/Mosinee Papers continues to improve and compete with other mills, future study and training may be required. The partnership formed between Wausau Mosinee Papers and NATC should be able to meet future needs.

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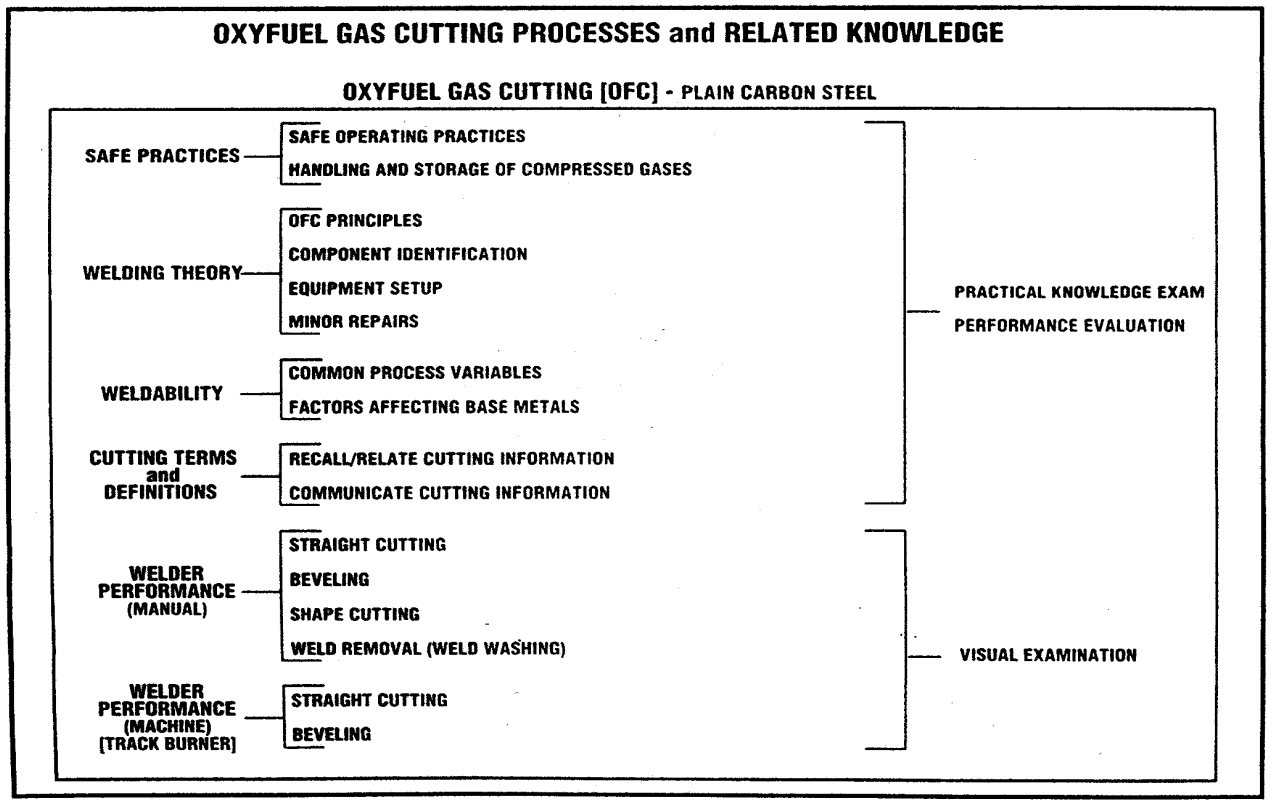
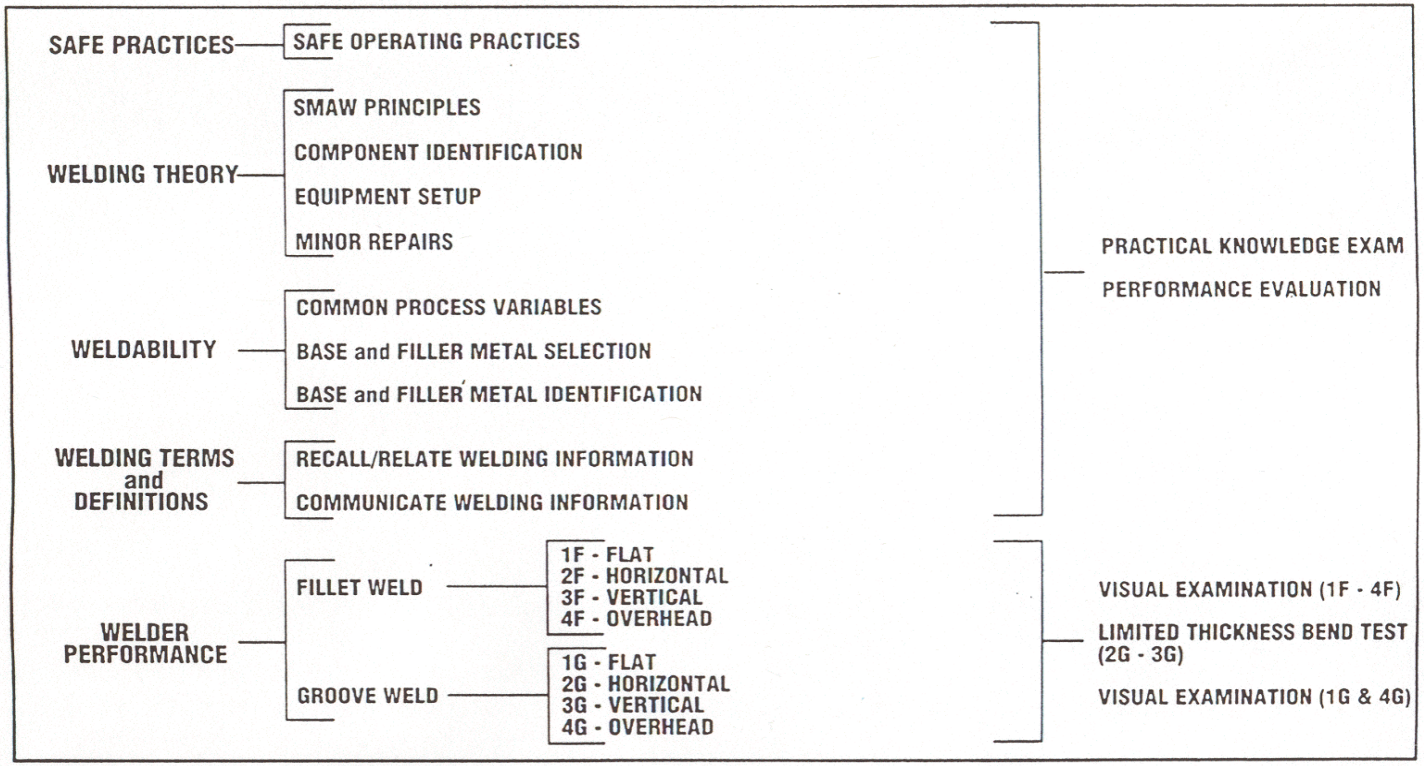
Appendix A


OXYFUEL GAS CUTTING PROCESSES and RELATED KNOWLEDGE
OXYFUEL GAS CUTTING [OFC] - PLAIN CARBON STEEL
SAFE PRACTICES
SAFE OPERATING PRACTICES
HANDLING AND STORAGE OF COMPRESSED GASES
WELDING THEORY
OFC PRINCIPLES
COMPONENT IDENTIFICATION
EQUIPMENT SETUP
MINOR REPAIRS
WELDABILITY
COMMON PROCESS VARIABLES
FACTORS AFFECTING BASE METALS
CUTTING TERMS and DEFINITIONS
RECALL/RELATE CUTTING INFORMATION
COMMUNICATE CUTTING INFORMATION
PRACTICAL KNOWLEDGE EXAM
PERFORMANCE EVALUATION
WELDER PERFORMANCE (MANUAL)
STRAIGHT CUTTING
BEVELING
SHAPE CUTTING
WELD REMOVAL (WELD WASHING)
WELDER PERFORMANCE (MACHINE) [TRACK BURNER]
STRAIGHT CUTTING
BEVELING
VISUAL EXAMINATION

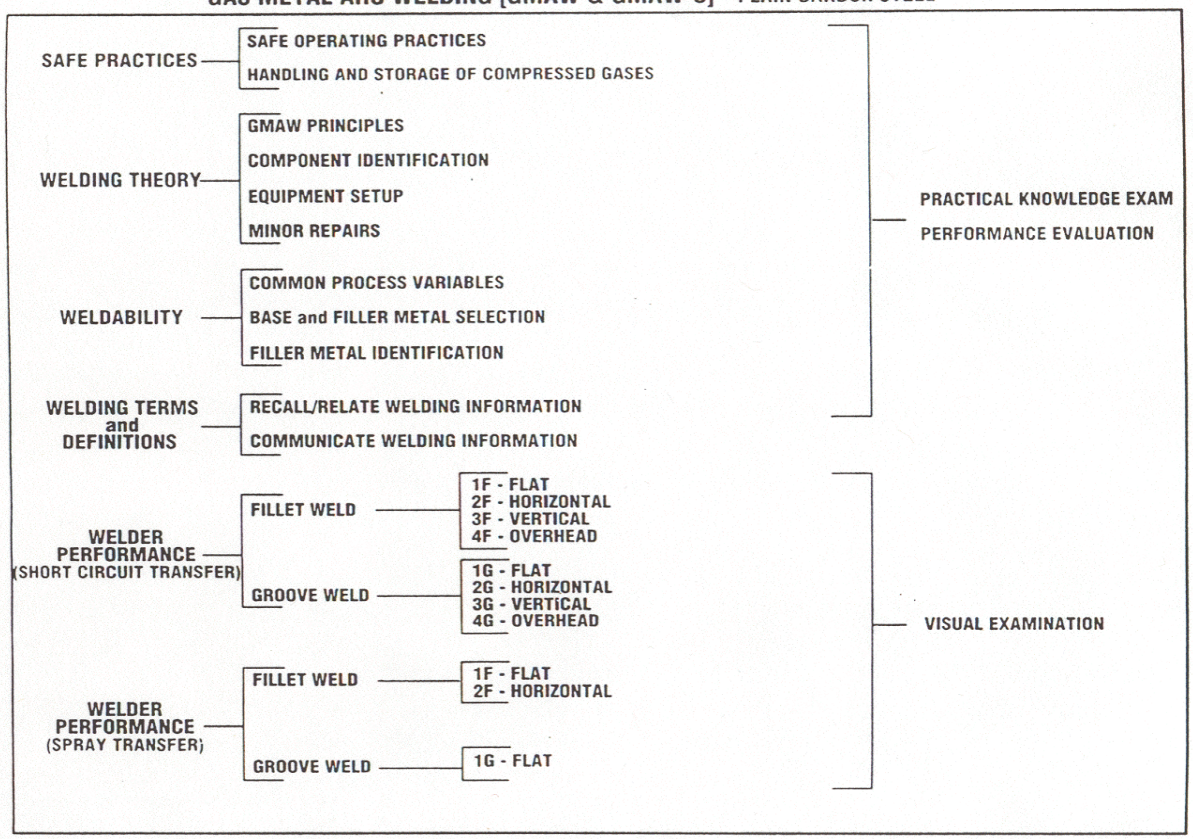
ARC WELDING PROCESSES and RELATED KNOWLEDGE

SHIELDED METAL ARC WELDING [SMAW] - PLAIN CARBON STEEL



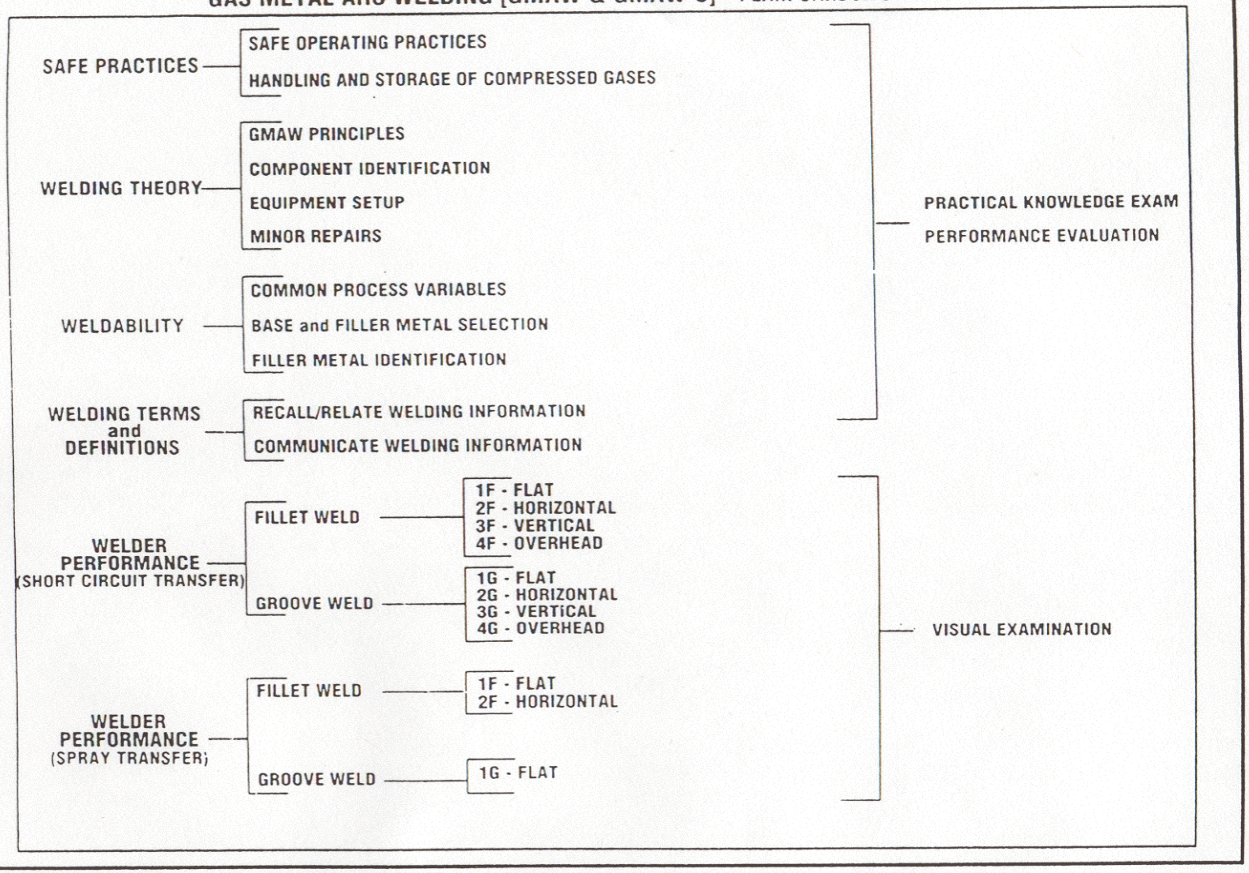
ARC WELDING PROCESSES and RELATED KNOWLEDGE (continued)

GAS METAL ARC WELDING [GMAW & GMAW-S] - PLAIN CARBON STEEL



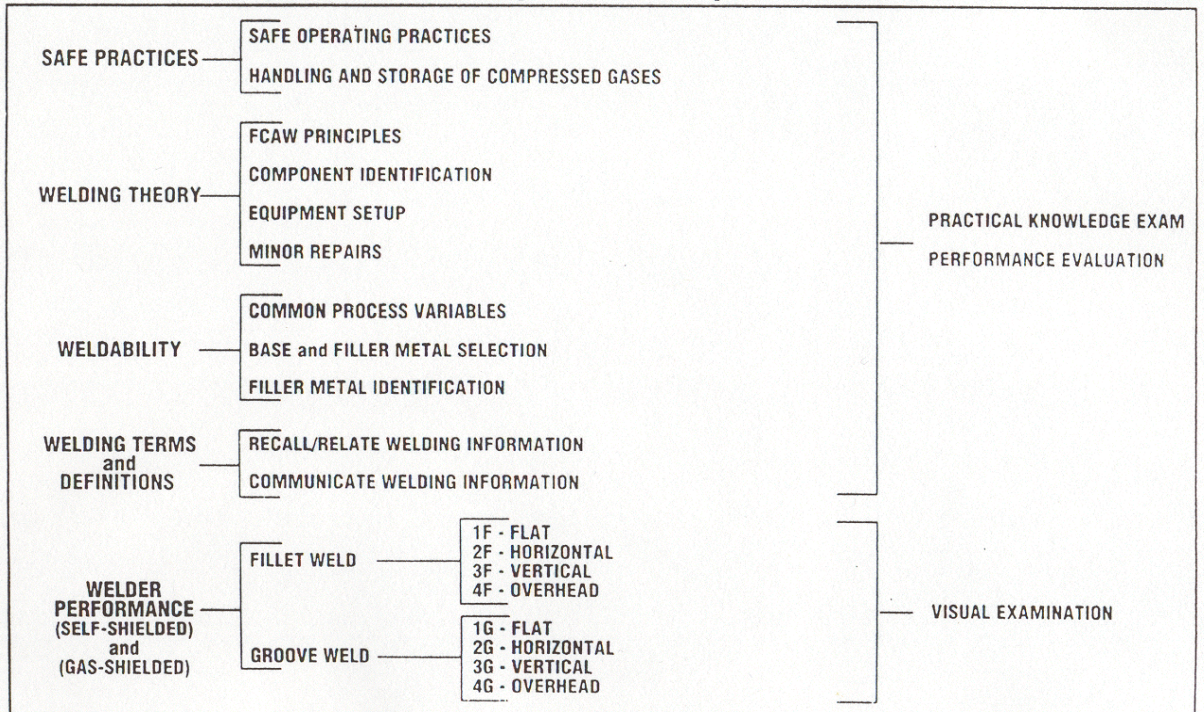
ARC WELDING PROCESSES and RELATED KNOWLEDGE (continued)

GAS METAL ARC WELDING [GMAW & GMAW-S] - PLAIN CARBON STEEL



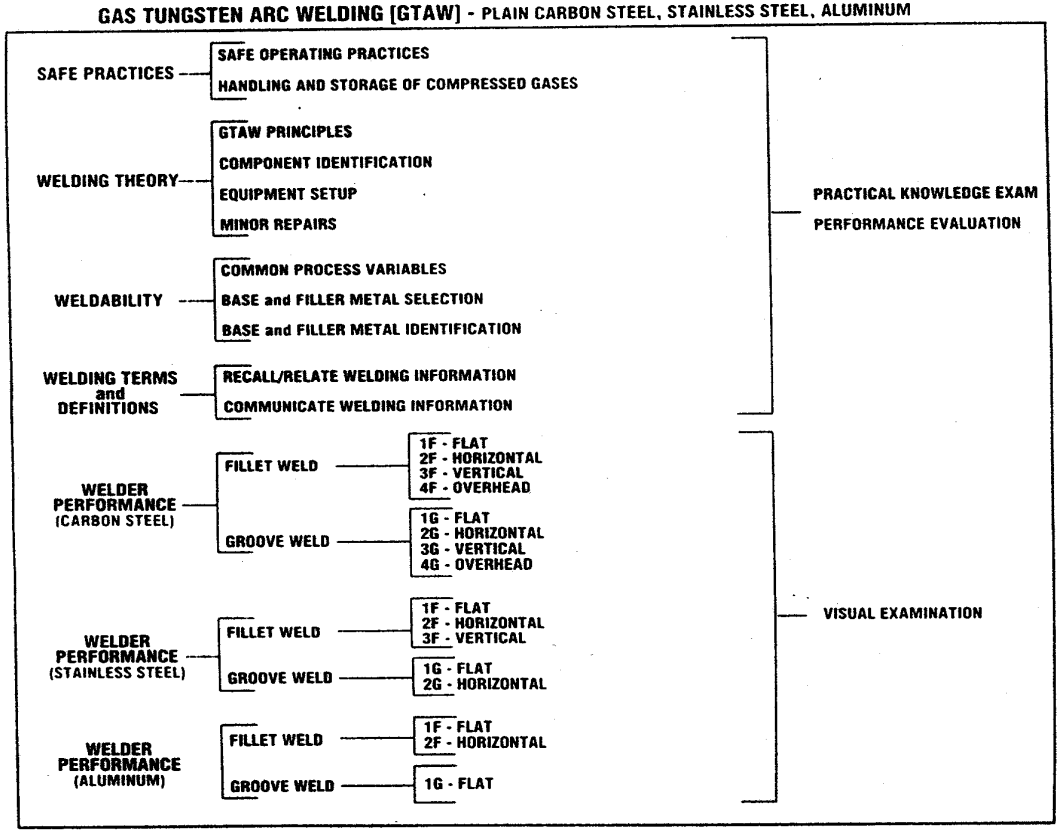
ARC WELDING PROCESSES and RELATED KNOWLEDGE (continued)

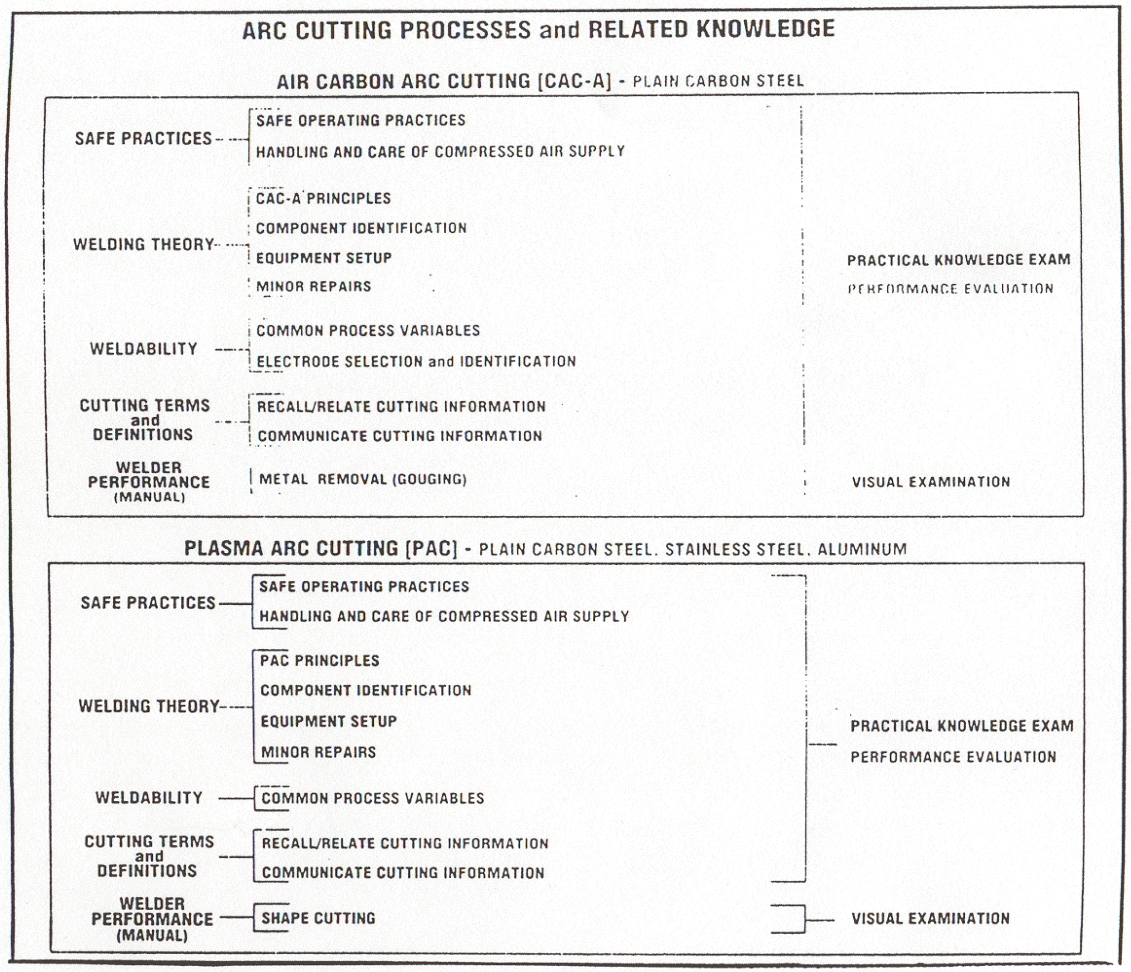
FLUX CORED ARC WELDING [FCAW & FCAW-G] - PLAIN CARBON STEEL



ARC WELDING PROCESSES and RELATED KNOWLEDGE (continued)

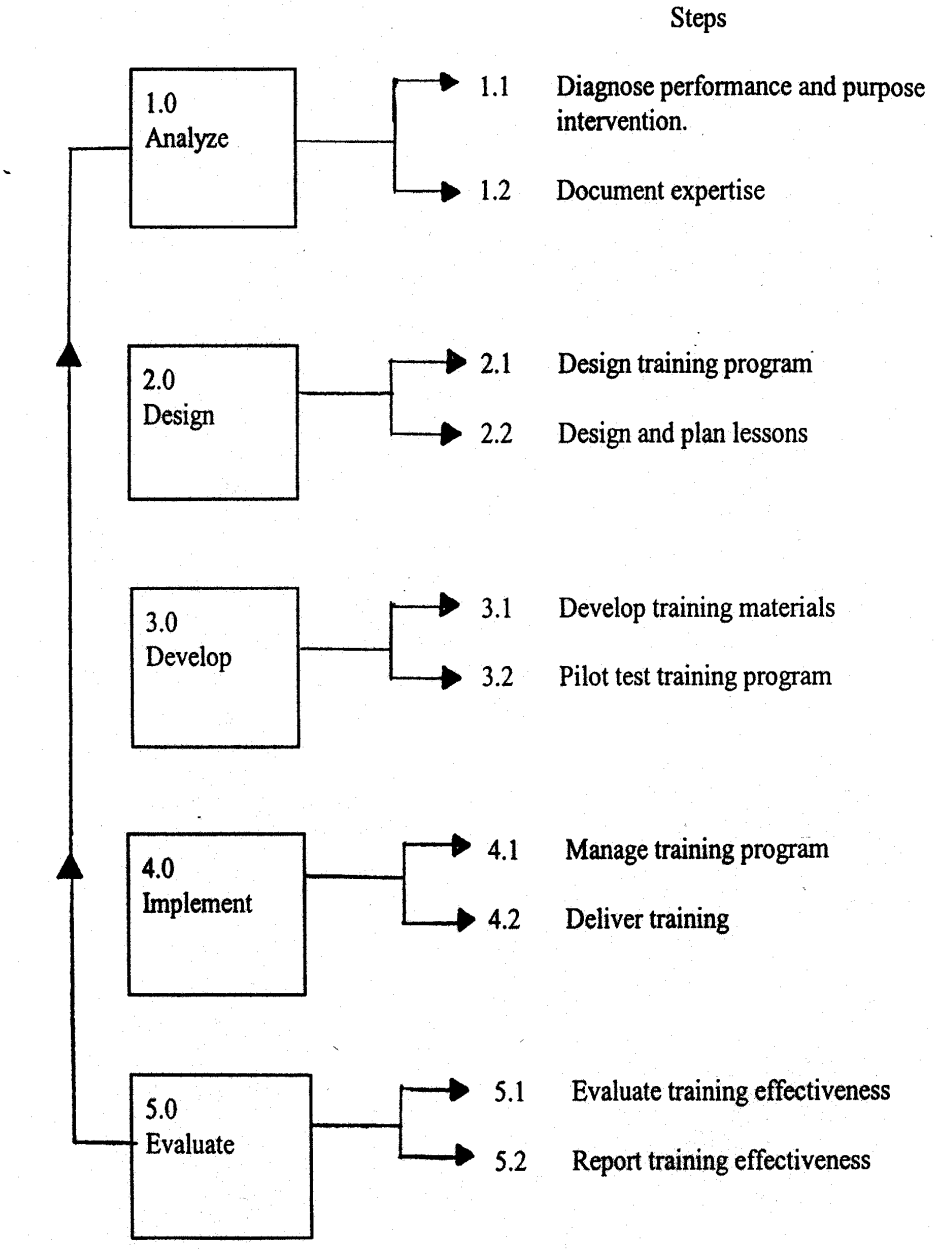
GAS TUNGSTEN ARC WELDING [GTAW] - PLAIN CARBON STEEL, STAINLESS STEEL, ALUMINUM



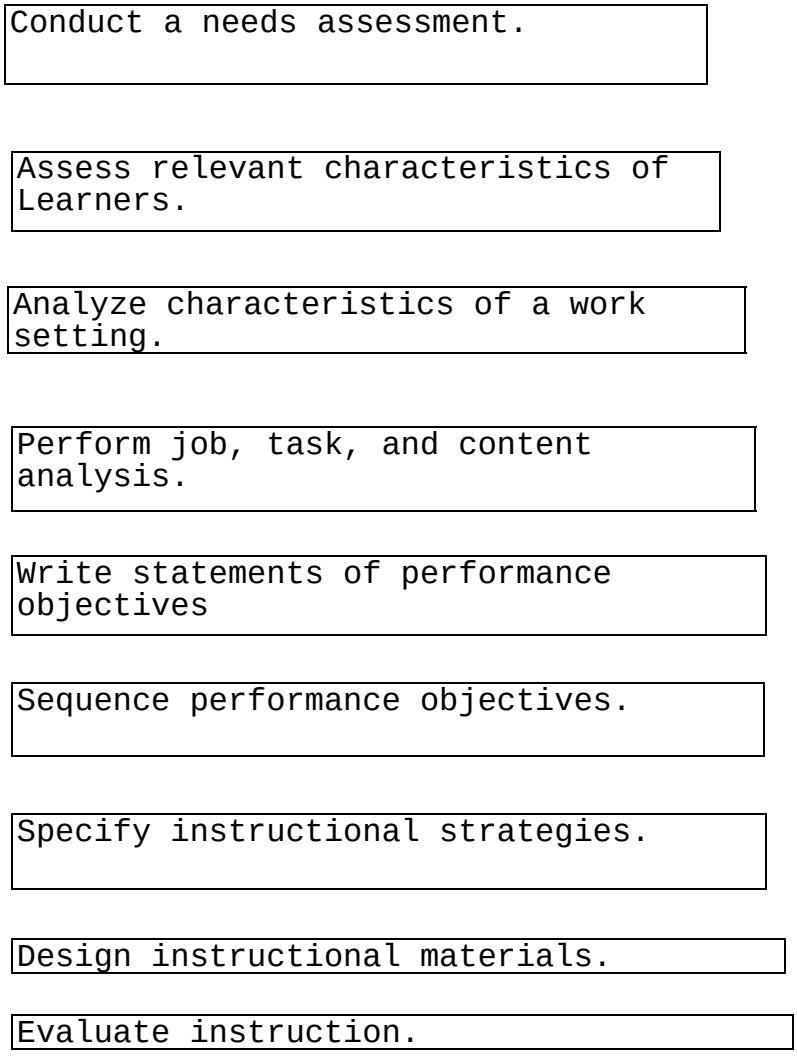

ARC CUTTING PROCESSES and RELATED KNOWLEDGE
AIR CARBON ARC CUTTING [CAC-A] - PLAIN CARBON STEEL
SAFE PRACTICES
SAFE OPERATING PRACTICES
HANDLING AND CARE OF COMPRESSED AIR SUPPLY
WELDING THEORY
CAC-A PRINCIPLES
COMPONENT IDENTIFICATION
EQUIPMENT SETUP
MINOR REPAIRS
WELDABILITY
COMMON PROCESS VARIABLES
ELECTRODE SELECTION and IDENTIFICATION
CUTTING TERMS and DEFINITIONS
RECALL/RELATE CUTTING INFORMATION
COMMUNICATE CUTTING INFORMATION
WELDER PERFORMANCE (MANUAL)
METAL REMOVAL (GOUGING)
PRACTICAL KNOWLEDGE EXAM
PERFORMANCE EVALUATION
VISUAL EXAMINATION
PLASMA ARC CUTTING [PAC] - PLAIN CARBON STEEL, STAINLESS STEEL, ALUMINUM
SAFE PRACTICES
SAFE OPERATING PRACTICES
HANDLING AND CARE OF COMPRESSED AIR SUPPLY
WELDING THEORY
PAC PRINCIPLES
COMPONENT IDENTIFICATION
EQUIPMENT SETUP
MINOR REPAIRS
WELDABILITY
COMMON PROCESS VARIABLES
CUTTING TERMS and DEFINITIONS
RECALL/RELATE CUTTING INFORMATION
COMMUNICATE CUTTING INFORMATION
WELDER PERFORMANCE (MANUAL)
SHAPE CUTTING
PRACTICAL KNOWLEDGE EXAM
PERFORMANCE EVALUATION
VISUAL EXAMINATION

Appendix B

Training for Performance System (TPS) Model (Swanson, 1996)



Instruction Design Process Model (Rothwell, Kazanas 1992)



Appendix C

The addresses and phone numbers of several organizations.

American Association for Adult and Continuing Education
1112 16th St. N.W., Suite 420
Washington, DC 20036
Phone: 202-463-6333

Association for the Development of Computer-Based Instructional Systems (ADCIS)
409 Miller Hall
Western Washington University
Bellingham, WA

Phone: 206-676-2860

International Federation of Training and Development Associations (IFTDO)
Institute of Management Education
7 Westbourne Road
Southport PR 8-2HZ
England

International Teleconferencing Association
1299 Woodside Drive
McLean, VA 22102
Phone: 703-556-6115

American Society for Training and Development (ASTD)
1640 King Street
PO Box 1443
Alexandria, VA 22313
Phone: 703-683-8100

Interactive Video Industry Association
1900 L Street, Suite 500
Washington, DC 20036
Phone: 202-872-8845

International Tape/Disc Association
505 8th Avenue, Floor 12A
New York, NY 10018
Phone: 212-643-0620

Society for Accelerative Learning and Teaching (SALT)
Box 1216
Welch Station
Ames, IA 50010
Phone: 515-292-3911

Society for Applied Learning Technology (SALT)
50 Culpeper Street
Warrenton, VA 22186
Phone: 703-347-0555

Appendix D

Nicolet Area Technical College
Lake Julia Campus
P.O. Box 518
Rhinelander, WI 54501

Dear Sir:

Nicolet Area Technical College (NATC) and Wausau/Mosinee Papers (WMP) needs your help in developing a training program for the new Mectech classification. You have been asked to assist us in this task because of your expert knowledge in your trade at Wausau/Mosinee Papers.

Please fill out the survey and return it to Wausau/Mosinee Papers Human Resource Management (HRM) Office by June 29, 2001. Your information will help us develop a training program that will provide you with the skills to excel in your new job as a Mectech.

The information from the survey will be handled with confidence and your assistance will be of considerable value to us. A copy of the results will be sent to you.

Thank you for your time,

Dennis Dettmering
Welding Instructor, NATC

Attention
Please return to WMP HR Office by Friday, June 29.

Wausau/Mosinee Papers
Weld Training Survey

Directions:

Please circle the number that best describes how important the following skills or competencies are for a Mechtech to perform his/her job at Wausau-Mosinee Papers. "4" is very important and "1" is not important.

Circle a number for each skill.

		Very Important			Not Important
		4	3	2	1
A.	Safety				
	Identify basic hygiene	4	3	2	1
	Read MS/DS	4	3	2	1
	Locate safety equipment	4	3	2	1
	Use lockout and tag out procedures	4	3	2	1
	Use safe lifting techniques	4	3	2	1
	Use hand tools safely	4	3	2	1
	Demonstrate good work habits	4	3	2	1
	Use rigging and hand signals	4	3	2	1
	Drive fork lift	4	3	2	1
B.	Identify metals and materials				
	Identify carbon steel	4	3	2	1
	Identify stainless steel	4	3	2	1
	Identify aluminum materials	4	3	2	1
	Identify cast iron	4	3	2	1
	Identify cracks and defects	4	3	2	1
C.	Oxy-acetylene welding/cutting				
	Perform safety procedures	4	3	2	1
	Prepare metal	4	3	2	1
	Weld with torch - "flat position"	4	3	2	1
	Cut metal	4	3	2	1
	Braze weld	4	3	2	1
	Solder weld	4	3	2	1

Heat and bend steel	4	3	2	1
Gouge heavy steel	4	3	2	1

D. Arc Welding				
Determine weld type and size	4	3	2	1
Prepare metal: cast iron, stainless, carbon steel, aluminum, cast magnesium	4	3	2	1
Set-up welder, rod, angle, size, techniques	4	3	2	1
Weld flat and horizontal fillet	4	3	2	1
Perform groove weld: flat and horizontal	4	3	2	1
Perform vertical up weld	4	3	2	1
Perform vertical down weld	4	3	2	1
Perform overhead weld	4	3	2	1
Perform pipe 6-G weld	4	3	2	1
Gouge heavy steel	4	3	2	1
Pass certification exam	4	3	2	1
E. MIG Welding				
Determine weld type and size	4	3	2	1
Prepare metal: cast iron, stainless, carbon steel, aluminum, cast magnesium	4	3	2	1
Set-up welder, rod, angle, size, techniques	4	3	2	1
Weld flat and horizontal fillet	4	3	2	1
Perform groove weld: flat and horizontal	4	3	2	1
Perform vertical up weld	4	3	2	1
Perform vertical down weld	4	3	2	1
Perform overhead weld	4	3	2	1
Perform pipe 6-G weld	4	3	2	1
Gouge heavy steel	4	3	2	1
Pass certification exam	4	3	2	1
F. TIG Welding				
Determine weld type and size	4	3	2	1
Prepare metal: cast iron, stainless, carbon steel, aluminum, cast magnesium	4	3	2	1
Set-up welder, rod, angle, size, techniques	4	3	2	1
Weld flat and horizontal fillet	4	3	2	1
Perform groove weld: flat and horizontal	4	3	2	1
Perform vertical up weld	4	3	2	1
Perform vertical down weld	4	3	2	1
Perform overhead weld	4	3	2	1
Perform pipe 6-G weld	4	3	2	1
Gouge heavy steel	4	3	2	1
Pass certification exam	4	3	2	1

G. Quality				
Follow quality procedures	4	3	2	1

	Visually inspect weld and product	4	3	2	1
	Bend test	4	3	2	1
	Use inspection tools: fillet gauges, gap gauges, weld gauges, etc.	4	3	2	1
	PT	4	3	2	1
	MT	4	3	2	1
	VT	4	3	2	1
	RT	4	3	2	1
	HT	4	3	2	1
H.	Blueprint Reading				
	Read basic blueprints: format, title block, update notes	4	3	2	1
	Recognize line types	4	3	2	1
	Read and interpret blueprint symbols	4	3	2	1
	Read and interpret welding symbols	4	3	2	1
	Interpret orthographic projections	4	3	2	1
	Interpret section views and cutaways	4	3	2	1
	Sketch parts	4	3	2	1
	Use shop prints	4	3	2	1
I.	Fabricating				
	Use grinder	4	3	2	1
	Use bandsaws	4	3	2	1
	Use shears	4	3	2	1
	Use ironworker	4	3	2	1
	Use hand brake	4	3	2	1
	Use roller	4	3	2	1
	Use drill press	4	3	2	1
	Tack weld	4	3	2	1
J.	Math				
	Do lineal measurement	4	3	2	1
	Convert fractions to decimals	4	3	2	1
	Use hand calculator	4	3	2	1
	Add and subtract decimals and fractions	4	3	2	1
	Convert inches to degrees	4	3	2	1
	Multiply and divide fractions and decimals	4	3	2	1
	Convert metric to english and back	4	3	2	1
K.	Communications				
	Use active listening skills	4	3	2	1
	Follow a written procedure	4	3	2	1
	Follow verbal instructions	4	3	2	1
	Complete and file documentation	4	3	2	1
	Write a progress report	4	3	2	1
	Complete requisition forms	4	3	2	1
	Make oral presentations - small group	4	3	2	1

L.	Human Relations				
	Interact effectively with customers	4	3	2	1
	Work effectively with supervisor	4	3	2	1
	Accept diversity in the workplace	4	3	2	1
	Actively participate in a team approach	4	3	2	1
	Accept change	4	3	2	1

Appendix E

Nicolet Area Technical College
Lake Julia Campus
P.O. Box 518
Rhinelander, WI 54501

Dear Sir:

Thank you for your time in filling out the survey we sent you on June 26, 2001. The information gathered was very important and will help us establish the most effective training program for the Mectech classification and Wausau/Mosinee Papers. A copy of the results are enclosed with this letter. If you have any questions or comments, please feel free to call me.

Thank you,

Dennis Dettmering
Welding Instructor, NATC

Appendix F

Nicolet Area Technical College

Customized Training Evaluation

Name of Company or Business Date

Name of Course

Name of Instructor or Technician

Indicate your response by placing a check (x) in the category that best describes the degree of satisfaction you experienced. Additional written comments are encouraged.

Training	**Excellent(5)**	**Good(4)**	**Fair(3)**	**Poor(2)**	**N/A**
1. Your overall rating of training	( )	( )	( )	( )	
2. Usefulness of training activities to your job	( )	( )	( )	( )	
3. The content of the training	( )	( )	( )	( )	
4. Time allotted	( )	( )	( )	( )	
5. The appropriateness of textbook, handout materials, audio visuals	( )	( )	( )	( )	( )
6. Assignments and evaluations	( )	( )	( )	( )	( )
7. Day and time of training	( )	( )	( )	( )	
8. Location of training	( )	( )	( )	( )	
Instructor or Technician					
9. Effectiveness of instructor/ technician	( )	( )	( )	( )	
10. Knowledge of instructor/tech- ician	( )	( )	( )	( )	
11. Preparedness and organization of instructor/technician	( )	( )	( )	( )	
12. Instructor/technician was easy to understand	( )	( )	( )	( )	
13. Instructor was patient and open to questions	( )	( )	( )	( )	
14. The instructor/technician met your overall expectations	( )	( )	( )	( )	

15. What were the strengths of the training? _____

_____

16. What aspects of the training needs improvement? _____

_____

_____

17. What other training is of interest to you? _____

_____

_____

18.Additionalcomments: _____

_____

DENNIS LEE DETTMERING

W10380 Deer Trail Lane (715) 623-0312
Deerbrook, Wisconsin 54424

HIGHLIGHTS:

- Welding instructor with 10 years of experience
- Designs and coordinates customized training
- WI 5 year certification to teach welding, metallurgy, and blueprint reading in Wisconsin Technical College System
- WI certification to give and evaluate welder certification tests
- Certified in time study and J.I. T. manufacturing application
- Experienced in robotics justification and programming
- Certified Manufacturing Engineer Technologist

PROFESSIONAL SUMMARY:

NATC WELDING INSTRUCTOR: Responsible for training students enrolled in the one year welding program that covers all types of welding including robotics, deliver instruction in related

areas including blueprint reading and metallurgy, design and

deliver customized training to employees in NATC district.

NTC WELDING INSTRUCTOR: Responsible for training students enrolled in the one year welding program that covers all types of welding including robotics, deliver instruction in related

areas including blueprint reading and metallurgy, design and

deliver customized training to employees in NTC district.

WELDING: Certified in all types of welding with 30 years of welding experience.

J.I.T. MANUFACTURING: Coordinated the cell concept of manufacturing in all Welding Departments at J.I. Case Wausau Plant.

SUPERVISION: Trained new employees in welding and safety at J.I. Case. Also trained Co-op students from U.W. Stout in Process Engineering Techniques.

STANDARDS: Certified in welding time study using stop watch and the M.O.S.T. System of Time Study.

ROBOTICS: Justification of two Robotic's Welding System and Programming of Area IRB2000 Robot.

ENGINEERING: Experienced in all types of Manufacturing Engineering such as Plant Layout, Cost Estimation, Problem Solving Techniques, and Maintenance.

EMPLOYMENT HISTORY:

NICOLET AREA TECHNICAL COLLEGE (NATC) Rhinelander, WI 54501	10/15/94 - Present
NORTHCENTRAL TECHNICAL COLLEGE (NTC) Wausau, WI 54401	8/20/92 - 12/30/94
SCHUETTE INC. Rothschild, WI 54474	2/21/91 - 8/13/92
J.I. CASE, C.E. DIVISION Wausau, WI 54401	1971 - 2/15/91
NORTHCENTRAL TECHNICAL COLLEGE Wausau, WI 54401	1970 - 1971

EDUCATION:

UNIVERSITY OF WISCONSIN - STOUT 1996 - Present
Menomonie, WI 54751
Degree: M.S. in Training and Development
Course work to complete Master's Degree to be conferred Summer 2001 upon completion of thesis.

UNIVERSITY OF WISCONSIN - STOUT 1993-1996
Menomonie, WI 54751
Degree: B.S. in Vocational Technical and Adult Education

NORTHCENTRAL TECHNICAL COLLEGE 1988 - 1992
Wausau, WI 54401
Industrial Engineering Technology Program
"Night School"

MAYNARD MANAGEMENT INSTITUTE 1983
Charlotte, N.C. 28244
M.O.S.T. Systems Applicator

MAYNARD MANAGEMENT INSTITUTE 1983
Charlotte, N.C. 28244
Fundamental Methods of Engineering and Time Study

NORTHCENTRAL TECHNICAL COLLEGE 1971

Wausau, WI 54401
Diploma: Mechanical Drafting

NORTHCENTRAL TECHNICAL COLLEGE — 1970
Wausau, WI 54401
Diploma: Welding

AWARDS:

Cum Laude Award - B.S. Degree — 1998
University of Wisconsin - Stout

Outstanding Graduate - Welding — 1970
Northcentral Technical College

PROFESSIONAL ORGANIZATIONS:

Society of Manufacturing Engineers
Member — 1989 - Present
Chairman — 1992 - 1993
Chairman Elect — 1991 - 1992
Treasurer — 1990 - 1991
Secretary — 1989 - 1990

American Welding Society — 1988 - Present

Member of Welding Advisory Board - NATC — 1994 - Present
Member of Welding Advisory Board - NTC — 1990 - 1992

REFERENCES: Furnished upon request