

LA-SUB--95-112

FINAL REPORT

**NOW ENHANCING WORKING
SKILLS**

THE "NEWS" PROGRAM

January 23, 1995

MASTER

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21

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APPENDIX

MEREX CLASS DESCRIPTIONS

INFORMATION PROCESSING SKILLS

IPS 70	People who take this class will have adequate functional information processing skills but will require a review and practice of some basic concepts. Help will be given in the areas of determining the main idea, drawing a conclusion, making inferences, and emphasizing improving general comprehension skills when working with more difficult texts. They will receive help with organizing and prioritizing information as well as some attention given to critical and creative thinking and improving communication skills. A writing component will be incorporated into the course that will reinforce the information processing skills taught.
IPS 12	This is a compact version of the IPS 70 with an emphasis on both receptive and expressive skills to manage and process information. It helps support and reinforce training at other levels.

MATH

M 90	Individuals placing into a 90-hour class will receive help in understanding basic math operations as well as information addressing math anxiety. Topics addressed will include a brief review of whole-number operations, fractions, decimals, percents, signed numbers, exponents and scientific notation, order of operations for complex formulas, inequalities, ratios and proportions, and simple algebra. Applications from work or RCT related materials will be emphasised in the course.
M 60	These individuals require only brief reviews of whole-number and decimal operations, and progress through the remaining skills listed in the Math 90 hour class at a more rapid pace.
M 30	This course covers all skills needed as prerequisites for success in Rad Con Training, and not included in the more basic math courses listed above. It also includes a brief exposure to some of the types of problems actually included in Rad Con Training. The 30-hour course is designed for those individuals without significant deficits in the skill areas addressed in the longer courses. It will also serve as a second, follow-up phase of math instruction for individuals who have finished one of the longer courses listed above. Topics covered include: use of algebraic properties, logarithms, linear equations, polynomials, radicals, quadratic equations, and conversions.
M 6	This is a customized math class for the RCT Project which will review basic and intermediate Algebra as needed, including logarithms, exponents, formulas, and conversions.

TEST SCORE RESULTS FOR THE MAT AND THE WAT

		IPS 60	
PARTICIPANTS		29	
WAT- 50 questions.		PRE	POST
GROUP AVERAGE		58%	76%

		MAT 60	MAT 90		
PARTICIPANTS		41	24		
MAT- 50 questions		PRE	POST	PRE	POST
GROUP AVERAGE		56%	82%	40%	72%

A 17 question algebra test was used in the M30 and M40 classes to determine pre and post-test scores. Results are below.

		M30 & M40	
PARTICIPANTS		23	
MAT- 50 questions.		PRE	POST
GROUP AVERAGE		41%	71%

TEST SCORE RESULTS FOR THE TABE

	IPS 60	
PARTICIPANTS	29	
TABE - READING	PRE	POST
GLE (Average)	8.6	9.6

	M60 & M90	
PARTICIPANTS	64	
TABE - MATH	PRE	POST
GLE (Average)	8.6	10.1

* National norms predict 1 GLE (Grade Level Equivalency) gain for every 100 hours of generic instruction.

CHALLENGE TEST RESULTS

Phase I Unit 1

*CT	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13
*N	74	74	70	70	70	70	68	58	61	59	59	58	56
*P	80%	80%	75%	75%	75%	75%	73%	62%	66%	63%	63%	62%	60%

* Total number in RCT NEWS Program = 93

* CT = Challenge Test (Lesson number)

* N = Number of individuals from the original 93 who completed or challenged out of that particular lesson.

* P = Percentage of individuals who completed or challenged out of that lesson as of 11/94.

Follow-up Survey to Merex IPS and Math Training.

Survey Distribution and Response Rate

Total # in program 106 106-15=91	Total # who left program due to retirement, change of job, illness etc. 15	# of IPS questionnaires administered 27 Response 14/27 52% Response	# of Math questionnaires administered 59 Response 33/59 56% Response
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Did you take the Merex IPS training?

Yes (14)

If the answer was yes, please comment about:

What you learned in the course	<ul style="list-style-type: none"> •Very positive experience. •Good refresher. •Speed reading. •Skimming. •Putting main idea into my head. •Great training! •Meanings of words. •How to write sentences properly. •Reading comprehension, reading bullets, skimming. •Helped in writing letters, filling out log book, proper pronunciation, definitions. •Improved reading. •Didn't find it as useful as the math portion. Wanted more time in math class. •How to retain material. How to stay interested. •Techniques on how to read a test. •Got a lot out of it. •Comprehensive reading. •Looking for and finding information for tests. •Learned a lot. Learned good tips on taking tests. •Learned different ways of remembering things. •Understand questions better. Understand things in general better. •More proficient at work.
How you have applied what you learned at work?	<ul style="list-style-type: none"> •In writing reports. •Yes, it helps a lot to address issues that come up. •Yes, to a great extent. We have to read a lot. •Yes, in our log book. •Not really able to apply. •RWs, SOPs, daily reading material. •Yes, a little bit. •Using word association. •At times I've used it at work.
How helpful was the course for the Rad Con training?	<ul style="list-style-type: none"> •Making it somewhat easier. •No. •Yes, quite a bit - got me used to writing and reading again. •Can comprehend more. •Yes, it helped me comprehend better. •Very. •Yes, prepared me better for it. •Yes, because we do lots of reading. •Helped with speed reading. •Helped out quite a bit. •Yes, it has helped me do better. •Yes, a little bit. •Very helpful - especially for testing. •Haven't taken Rad Con training yet.

What you liked best about the course?	<ul style="list-style-type: none"> •Different skills. How to work items out. •Instructor (x 8) •Everything - instructors. •Understanding everything. The way it was taught. •Just liked to learn what I had forgotten. •Instructor, very smart. •Learned things that made me feel proud. •Liked teachers. 										
What you liked least about the course?	<ul style="list-style-type: none"> •Some information could have been elaborated. •More on writing, punctuation. •Nothing (x 8) •Not enough time. •Could be more extensive. •Lunch hour time. •Too short. 										
Have you taken any other courses since attending the Merex course? Yes(1) No(13)	<ul style="list-style-type: none"> •Two day reading comprehension course at Canyon Complex. 										
How would you rate the Merex IPS Course compared to other courses you've taken at the Laboratory?	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">•Way Above Average</td> <td style="width: 10%;"></td> </tr> <tr> <td>•Above Average</td> <td style="text-align: right;">9</td> </tr> <tr> <td>•Average</td> <td style="text-align: right;">5</td> </tr> <tr> <td>•Below Average</td> <td></td> </tr> <tr> <td>•Way Below Average</td> <td></td> </tr> </table>	•Way Above Average		•Above Average	9	•Average	5	•Below Average		•Way Below Average	
•Way Above Average											
•Above Average	9										
•Average	5										
•Below Average											
•Way Below Average											
Please tell me any other comments you would like to make about the IPS Course.	<ul style="list-style-type: none"> •Will take any more advanced classes. 										

Did you take the Merex Math class ?

Yes (33)

No

If the answer was yes, please comment about:

What you learned in the class.

- Learned a lot (whole). Lots of math.
- Didn't know anything before or forgot.
- Basic math, algebra - good refresher.
- Excellent class! Everything - simple math to algebra.
- Good refresher on math, algebra.
- Brushed up a lot on basic math, algebra, formulas.
- Helped with outside studies, algebra.
- A whole lot; good refresher; decay formula.
- Basics in algebra equations, conversions. Made it easier to understand.
- Retuned my math background; refreshed my memory; helped a lot.
- Got a lot out of the class; refresher and new information.
- Ability to do math if explained on adult level; new concepts; learned to keep up.
- Learned a lot from the class. Knew little before that.
- Enabled me to get comfortable with algebra.
- Very positive experience.
- If you don't use, you lose - good refresher.
- Really helped a lot.
- Algebra - great to relearn.
- How to use the calculator properly.
- How to manipulate numbers, algebra.
- Got lots out of it - good refresher.
- Multiply, divide, fractions, algebra.
- Picked up a lot. Benefitted tremendously.
- How the basic math was taught; using calculators.
- Interesting. Got something out of it.
- Made it easier to understand. Picked up a lot.

How you have applied what you learned at work?

- Not yet.
- Eventually.
- Some parts.
- A little.
- Will eventually.
- Some.
- Simple math.
- Yes, to some extent.
- Yes, indirectly in different aspects of health physics formulas.
- Does not really apply to work except minimally. Mostly half-life formulas.
- Some of it.
- Yes in a number of areas. I can now do the math on my own.
- Can't apply algebra; maybe other things.
- Has helped overall - good refresher.
- Yes, more calculations, tests, many ways. Personal ways too.
- Yes.
- Not at the moment.
- No, don't do math at work except division. No algebra.
- Yes, easy.
- Yes, with basic understanding of exponents etc.
- Yes, using the calculator.
- Yes, figuring out exposure rates etc.
- Once in a while.
- Figuring calculations.
- Not now, but will for Rad Con training.
- Very little.
- Yes, can do equations at work now.

<p>How helpful was the class for the Rad Con training?</p>	<ul style="list-style-type: none"> •It helped but still flunked because of Rad Con teachers. Passed eventually. •Would have been if the training was combined - Rad Con trainer had us confused. •Passed the test. •Very helpful for Rad Con I - helped pass the test. •It helped. •Still going through - yes. •Helped pass the test! •Yes, helped pass the test. •Only used in 101 - helped. •Yes, helped pass. •Definitely - helped with the test. •Yes, it helped. •Helped on training and test. •Pretty helpful. •Very.
<p>What you liked best about the class?</p>	<ul style="list-style-type: none"> •Learning a lot. •Very great teachers. •Small class, comfortable, teacher. •Great instructor! •Instructor - she was great! •Way it was taught. Great instructor - good attitude. •Everything, especially instructor. •Slower pace -we weren't rushed. Great instructor. •Small class, individual attention, great teacher - good about calling her anytime. •Learning!!! •Great course! Teacher got down to basics. Explained things well. Got specific. •Good instructor. Got us interested. •Instructor's attitude and way of presenting material. •Instructor - excellent - explained real well. •Interaction between students and instructor. Great instructor. •Enjoyed it. Instructor was great. •Can ask anything. Handled well by instructor; great instructor. •Small, open setting. •Instructor (x 4). •Instructor, very informative class. •Great instructor. Was taught beneficial stuff. •Just great!!! •Refresher, great instructor. •Breaking down equations and progressing from there. •Learned things I never learned in high school. •Instructor - how it was presented. •Teacher. •Everything.

What you liked least about the class?	<ul style="list-style-type: none"> • Nothing (x16) • Not enough time. • Noisy room, bad temperature. • Couldn't run during my lunch hour. • Time - no lunch hour - took away my workout. • Hours too early (got too cold in winter); lot of noise outside at hotel. • Needed more time. • Would rather it be longer. • Weren't able to go into depth. Needed more time. • Needed more time to emphasize decay law, half life calculations, health physics. • Where it was at. • Would like to have more class. • Needed more that applied to Rad Con, i.e. decay problems etc. • Needed more time. • Too long - 1 hour classes would have been better. • Was confused. 				
Have you taken any other math classes since attending the Merex class?	Yes (6) No (27)				
If you answered yes, what kinds of classes have you taken?	<ul style="list-style-type: none"> • College algebra. • Took algebra at NNMCC. Learned more at Merex. • Introduction to Radiation Math. • UNM class (math science) • NNMCC algebra class (Radiation Math) • NNMCC - Radiation Math Science. 				
How would you rate the Merex Math class compared to other classes you've taken at the Laboratory?	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%; vertical-align: top;"> <ul style="list-style-type: none"> • Way Above Average • Above Average • Average • Below Average • Way Below Average </td> <td style="width: 60%; vertical-align: top; text-align: right;"> 9 21 3 </td> </tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • Suggest getting more time for training. • Very, very good class! • Great class. Do it more often with more time. • Everyone should have a chance to take these classes. • Great class. Teach it once every 2 years - refresher. Ann and Beverlie were great. • Instructor was great. Real patient. • Keep it ongoing. • Excellent instructor. Can she teach RCT training? • Good instructor. • Good class. Want more. • Will take any more advanced courses. • Great atmosphere. Good interaction. Liked the class.! • Enjoyed it. • Great class. More enjoyable than other Lab classes. • Great class. Loved it. • Teachers should have been involved in Rad Con review for applicable math. • Continuation of classes. Clarification demonstrations. • Needed more extensive training in Rad Con math. • Have more advanced classes available. Taking advanced classes at UNM. • Would like an overview every so often (1 or 2 a year) especially algebra. • Great class. Worth taking. Good instructor. • Need same quality of teachers in other classes. </td> </tr> </table>	<ul style="list-style-type: none"> • Way Above Average • Above Average • Average • Below Average • Way Below Average 	9 21 3	<ul style="list-style-type: none"> • Suggest getting more time for training. • Very, very good class! • Great class. Do it more often with more time. • Everyone should have a chance to take these classes. • Great class. Teach it once every 2 years - refresher. Ann and Beverlie were great. • Instructor was great. Real patient. • Keep it ongoing. • Excellent instructor. Can she teach RCT training? • Good instructor. • Good class. Want more. • Will take any more advanced courses. • Great atmosphere. Good interaction. Liked the class.! • Enjoyed it. • Great class. More enjoyable than other Lab classes. • Great class. Loved it. • Teachers should have been involved in Rad Con review for applicable math. • Continuation of classes. Clarification demonstrations. • Needed more extensive training in Rad Con math. • Have more advanced classes available. Taking advanced classes at UNM. • Would like an overview every so often (1 or 2 a year) especially algebra. • Great class. Worth taking. Good instructor. • Need same quality of teachers in other classes. 	
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LOS ALAMOS NATIONAL LABS
SKILLS UPGRADE PROGRAM
Student Feedback Statistics

key: 5=strongly agree, 4=agree, 3=uncertain, 2=disagree, 1=strongly disagree

Teacher

Course	N	1	2	3	4	5	6	7	8
IPSW	19	4.8	5.0	4.9	4.6	4.4	4.5	4.4	4.8
IPS12	43	4.5	4.6	4.4	4.1	4.1	4.0	4.0	4.1
IPS70	26	4.5	4.9	4.7	4.5	4.5	4.5	4.4	4.5
M6	4	4.8	4.8	4.8	4.8	4.0	4.5	4.8	4.3
M30	12	5.0	4.9	4.8	4.4	4.1	4.2	4.2	4.3
M40	9	4.9	4.9	4.4	4.1	4.0	3.8	4.1	4.3
M60(110)	30	5.0	5.0	5.0	4.1	3.7	4.6	4.4	4.4
M80	5	5.	5.	5.	4.6	4.2	4.6	4.6	4.8
M90	14	5.0	5.0	4.9	4.3	3.9	4.4	4.6	4.7

Executive Summary

In October of 1992, Los Alamos National Laboratory and Merex Corporation began a pilot basic skills program to enhance workers' skills. The program, known as the NEWS (Now Enhancing Working Skills) Program, was implemented by the Training and Development (T&D) Group of the Human Resources Division.

A group of 106 employees known as Radiological Control Technicians (RCTs) from ESH-1 (Environmental, Safety, and Health) were targeted to take mandated DOE (Department of Energy) training. After a joint meeting with T&D, two Health and Safety Groups, and Merex, a comprehensive needs assessment was conducted by Merex. The needs assessment looked at present skill levels of the employees, job skill demands, organizational profile information and the skills required to be successful in the mandated DOE training. Based on findings from the needs assessment, employees were scheduled to receive training to improve their skills in reading and math. The math classes included basic math instruction as well as a higher level math skills curriculum that was developed by Merex specifically for this project.

Evaluation of the program included formal tests along with continued course evaluations, student evaluations and instructor evaluations following each class. An independent follow-up survey was conducted by LANL staff to determine the effectiveness of Merex training.

The main goal of the LANL/ Merex partnership was to help RCTs prepare for mandated DOE Rad Con training and job performance by improving their information processing and math skills. Preliminary results from the DOE training, course test scores and participant comments about Merex training indicate the partnership has been a successful one.

A second goal of this project was to use the information from this small group to make some predictions about the Laboratory as a whole. There were 3 trends that appeared in the pilot.

- Few people at the Laboratory have very low basic skills below a fourth grade level.
- Laboratory employees who benefit most from a basic skills enhancement program tend to place in the mid range (sixth through eighth grade level equivalency).
- The skills gap is larger in math than in information processing.

There may be similar technical groups in the Laboratory that have to pass mandated training needed for successful job performance who could benefit from the NEWS program. Based on the above trends, some educated guesses can be made about the typical kinds and amounts of basic skills training needed to prepare employees to succeed in mandated training. LANL could maximize return on investment in basic skills training by targeting training for good employees who could be even better. Such cost effective training would increase job skills and productivity resulting in a much more flexible workforce.

ESH clearly made the commitment to prepare their technicians to undertake mandated DOE training. The collaboration between the Environmental, Safety and Health groups, Training and Development, and Merex was viewed as a necessary piece of the compliance puzzle. The success of the project is indicated by test scores, course evaluations, the independent follow-up survey and success during Rad Con training. The Merex training helped employees learn much more than just basic skills. They developed the attitudes and skills of responsible learners who are more flexible and open to the changing demands of the work environment.

Background

A Laboratory-wide Basic Skills Task Force was established in November of 1990. The Task Force performed an informal needs assessment. They identified some problems with basic skills at the Laboratory. As a result, in the spring of 1991 the Task Force recommended that a basic skills pilot program be implemented. The results of the pilot program would help determine if a basic skills program needed to be implemented at the Laboratory in the future. A request for proposal was issued to find a subcontractor who would be knowledgeable and experienced in workplace literacy programs.

At the same time, an effort was made to find a group who could serve as the pilot group. An Environmental, Safety and Health (ESH-1) group had identified their health physics technicians, subsequently named Radiological Control Technicians (RCTs), as a possible pilot group. Even though the whole Laboratory was experiencing budget cuts, ESH-1 was still expected to provide a highly productive and flexible workforce. The demands on the Health Physics Group for radiation monitoring was not reduced. Therefore it was necessary that all RCTs achieve a high level of skills and the flexibility to work in any environment.

Some of the RCTs had strong backgrounds and skills in health physics. Often they had received training in some branch of the service or had attended college programs. Other RCTs, some of whom had been at the Laboratory for many years, received their RCT training on the job to do specific monitoring tasks. In order to help the RCTs meet the needs of the Laboratory, the Health and Safety Division Leader agreed that the RCTs should participate in the NEWS pilot. By the time the pilot was scheduled to begin, DOE had also mandated 240 hours of training for RCT qualification which made the assessment and training of this group of employees imperative. The company chosen to provide the training to close the skills gap was Merex Corporation.

Merex and the NEWS Program

The Merex Workplace Education program is based on an "information processing approach" instructional model with a workplace focus. The training is in basic reading and math skills with an emphasis on learning how to learn, critical and creative thinking, and problem solving. Merex has developed both Information Processing Skills (IPS) and Math Skills resource books which are used extensively during the training. The resource books are used in conjunction with workplace materials. For this pilot, additional supplemental learning materials were also taken from the DOE Radiation Control Manual. Merex also developed additional higher level math materials that were used in addition to the basic math instruction provided by Merex.

Implementation

To be successful, the NEWS Program had to be understood and supported by all levels of management as well as by the employees who would be participating in the program. To ensure this support, ESH-1, T&D, and Merex conducted pre-instructional meetings with the participating employees. Each step of the program was explained including project goals, assessment, class placement, testing and evaluation, and anticipated results. Employees were assured that the pilot was to help improve their chances for success during the mandated DOE training.

The first step in the LANL/Merex partnership was to perform a formal needs assessment. A comprehensive needs assessment was conducted to evaluate the relationship among the essential factors of job tasks, written materials, basic skills, and organizational structure. It began with a planning session involving personnel from the Health and Safety groups, Training and Development, and Merex to discuss manager and employee orientations to the project, time lines, goals of the project and expectations of everyone involved.

Needs Assessment and Placement

A skills assessment using the Test of Adult Basic Education (TABE) was given the following week to evaluate an individual's basic reading and math skills. Information gathered from personal interviews, job shadowing, questionnaires, tours of the work areas, and job descriptions to determine the cognitive requirements for particular jobs. The TABE results and the job information gathered provided a profile of training needs. The Merex technical writing staff also evaluated parts of the Rad Con study guide to help determine the skills gap between what people know now and the level of proficiency needed to succeed in the Rad Con training. Finally, an organizational profile was developed from information received during focus groups, personal interviews, observations and meetings with management.

The results from the Comprehensive Needs Assessment were compiled and delivered to management in a final report along with recommendations for training. Classes were scheduled during work time, local teaching staff was interviewed, hired, and trained by Merex and a dedicated training room was set up.

Results and Recommendations

Based on TABE results of 109 employees training recommendations were made for both Information Processing Skills (IPS) training and Math (M) training. The following table shows the recommended hours of training and the number of employees in each group.

Training Hours Recommended for RCTs

Total = 109	*IPS 6 or 12	IPS 70	Exempt		
*N =	76	29	4		
Total = 109	*M 6	M 30	M 60	M 90	M120
N =	18	32	37	18	4

*** IPS** = Information Processing Skills class hours

*** M** = Math class hours

*** N** = Number of individuals recommended to take that amount of training.

IPS training recommendations were based strictly on TABE results. In math, however, the TABE did not sufficiently test for the algebra skills needed for RCT training. As a result, for those who tested high on the TABE, Merex developed a math test to identify those needing some algebra training prior to RCT training. Eighteen out of the 109 tested out of all required math, but were offered 6 hours of refresher algebra on a volunteer basis. Everyone else was placed into 30, 60, 90 or 120 hours of math training based on test results. Some people were exempt from any of the training. Of these, some were management personnel who took the test for validation purposes and the rest were employees who had already received RCT qualification training in an organization where they had worked previously.

Program Development

Following the needs assessment, Merex customized the curriculum and trained instructors. Training began in July of 1992. Classes met for two hours twice a week and were kept small (6-9 individuals) due to workplace constraints. The RCTs provide essential health physics services to operating groups at the Laboratory. As a result, when a number of RCTs from the same group needed training, particular attention had to be given to who was scheduled at what time.

Employees feel more comfortable learning new skills concepts with familiar material. To accomplish this Merex integrated its curriculum with workplace materials that were gathered throughout the project. Reinforcement of information processing skills and basic math and algebra skills was accomplished by using the Rad Con study guides, workplace forms, SOPs and daily log entries.

The math program required extensive customization because of Rad Con training. An algebra curriculum based on the Rad Con study guides was developed. Instructors compiled a 14 chapter notebook with basic math and algebra instruction and practice sheets which incorporated the math from the Rad Con Manual. This algebra skills curriculum provided strong review for some who had taken algebra in the past. Others, however, had to learn the algebra concepts for the first time. As a result, the algebra training hours had to be adjusted for various classes. Some classes received as little as 30 hours of the algebra with no basic math curriculum. Other classes received 60 to 90 hours of basic math curriculum and up to 56 hours of the extra algebra class. Those who were learning algebra for the first time had the more difficult challenge. A factor that contributed to this difficulty was that some algebraic concepts required for the RCT training are not currently encountered at work by many of the RCTs, so they were unfamiliar with the material.

Statistical tracking was another aspect of program development. Statistical tracking for the IPS and Math training was based on two test types : the TABE (Test of Adult Basic Education) and reading and math tests developed by Merex to measure skills taught in the courses. The TABE is a national, norm-referenced test that measures basic comprehension and math skills. It is a generic test, however, with some limitations in its ability to demonstrate improvements made by adult learners in a work setting. Therefore, additional pre- and post-tests, the Work Application Test (WAT) in the IPS courses and a Math Application Test (MAT) in the math courses, were administered. Test items in the

MAT and WAT were developed from the Rad Con Study Guide as well as workplace materials. As a result, they are considered the best measures of participant progress.

Customizing the curriculum to fit the project and tracking participant progress are both important aspects of any skills enhancement program. Equally important, however, is how participants use the information processing and math skills at work or during compliance training. An observation form was used to gather data about how the Merex classes impacted work performance in the work areas. Update meetings between the supervisors and project manager were held to discuss how the program was going, any problems that may have arisen, and any concerns that supervisors might have. Getting feedback from supervisors was an integral part of the program evaluation. Some supervisor comments were:

- "People are communicating better."
- "People have a positive attitude and present themselves better in meetings."
- "People are using the math skills for Rad Con study."
- "I receive fewer complaints about having to go through RCT training. I'm not sure, but perhaps the (Merex) training has reduced their anxiety."
- "The math part really helped people out. They gained confidence. One person was afraid and was going to change jobs but was surprised that he passed the math test right away."
- "People that I supervise felt comfortable with the Merex instructors."
- "Some people made complete turnarounds about wanting to learn math."
- "Significant improvement in writing skills. Vocabulary was improved."
- "Report writing is higher quality. Merex played a major role."

Employee comments about how they have applied what they have learned on the job included:

- "I've improved my reading already and I am using what I learned at work."
- "I look for context clues more at work."

- "My log book is more thorough."
- "The class has helped me to write better and fill out forms more accurately."

Program Quality

To ensure ongoing quality in the skills enhancement program, participants were interviewed at the beginning, middle, and end of the training to get feedback on how the training was being received. Instructors also met with the project manager during regular staff meetings to discuss any aspects of the training that could ultimately improve the quality of the program. Initial comments ranged were:

- "I don't like being forced to take training"
- "Afraid it will be hard"
- "Think it is a waste of time"
- "I am learning more than I thought I would"
- "Enjoy it"
- "Things I've forgotten are coming back".

By the middle of the class, the employees were commenting about learning from each other and enjoying each other's company in the classes. When some math classes were finishing up people were saying:

- "I wish it was longer."
- "We love it, we like it."
- " It has been a great class - better than when I was in real school"
- " The instructors were great. They came down to our level."

Other comments pertained to instructors, materials, what people liked most/least about the class and job applications of the material. (See Appendix). Suggestions from class members for lessons learned included having even more work-related materials for practice using the skills. People were eager to improve their skills and were very appreciative for receiving this training during their work hours.

Instructors are vital to providing a quality skills enhancement program. Intensive instructor training was provided by Merex both initially and on an ongoing basis. Training concentrated on both content and process. Instructors not only learned how to teach Merex material but also how to interact with participants in a positive and understanding manner. Instructors completed Instructor Feedback Forms at the end of every course they taught. This helped determine what kinds of instructional changes and program improvements were needed.

Radiological Control Technician Training

While participants were beginning Merex training, the Environment, Safety, and Health Training Group (ESH-13) had the responsibility to organize the follow-up RCT training. They had to develop challenge tests for each unit of the Rad Con Study Guide lessons as well as curriculum for classroom training. The RCT training was divided into two phases. Phase I, Unit 1 consisted of 13 lessons of study based on the Rad Con Study Guide. Phase I, Unit 2 was 19 hands on lessons each followed with a test.

After completing all of the vendor training, participants were eligible to begin either challenge tests for the RCT training or to attend the live classroom training provided by ESH-13. The ESH-13 staff schedule and track participant progress as they work their way through the qualification process. Preliminary data from ESH-13 indicates the number of individuals who challenged out of particular tests or completed RCT classes. Challenging out of Rad Con lessons and/or being successful in the Rad Con training would be an indicator of the effectiveness of basic skills training.

Follow-up Survey

A follow-up survey was administered by Training and Development staff approximately 3 months following the final basic skills classes. Since training was conducted from July of 1992 to May of 1994 some classes had been completed for over a

year when the survey was conducted. The survey was administered to 27 individuals who took 70 hours of IPS training and to 59 individuals who took at least 100 hours or more of the math training. Response rates were as follows.

14/27 responded = 52% response rate
33/59 responded = 56% response rate

The following questions were asked on the survey:

1. What did you learn in the course?
2. How have you applied what you learned at work?
3. How helpful was the course for the Rad Con training?
4. What you liked best /least about the course?
5. Have you taken any courses since the Merex courses?
6. How would you rate the Merex courses (IPS and Math) compared to other courses you've taken at the Laboratory?

Overall results indicated a very positive response toward the basic skills training. Nine employees rated the IPS training as above average and 5 rated it as average. In the math classes 9 employees rated the training as way above average, 21 as above average and 3 as average. Complete results of the survey are located in the appendix.

Lessons Learned

There are many positive results from the LANL/Merex partnership to improve RCTs skills. But, as in any project, there are also lessons to learn and approaches that may work better the "next time".

For this project, more dialogue was needed up front about time allowed for training to account for individual differences. For example, some had never taken algebra, so it was hard to predict how difficult the algebra would be for these participants. For others, individual tutoring sessions would have been helpful. During future projects, training options (such as extending training time for some or providing individual tutoring) need to be discussed prior to the project beginning.

Another lesson learned also had to do with communication. There needed to be more interaction and communication between the vendor and ESH-13 (Rad Con training). More communication would have ensured a smoother transition from basic

skills training to the ESH-13 training. For example, individuals were sometimes trained to do the math a certain way in the Merex class and in a different way in the ESH-13 class. This was especially unsettling for those individuals who had a high level of math anxiety and who had just encountered the algebra concepts for the first time. While it is legitimate to expect everyone to learn different methods, communication between Merex instructors and ESH-13 instructors would have made it easier to go from one class to another.

A third lesson learned had to do with scheduling and attendance. The RCTs have to be present for certain work areas to function properly. If they are scheduled for training, they must have a backup RCT technician cover for them. At times participants needed to miss a class due to lack of technician backup. In future projects, more emphasis needs to be placed on providing backup services when an individual is scheduled out for training.

Conclusion

The partnership between Training and Development and Merex to provide basic skills training was a strong commitment by ESH-1 to prepare their technicians to undertake mandated DOE training. From the start, basic skills training was recognized as a necessary piece of the compliance puzzle.

By going beyond traditional approaches to training, learning opportunities were provided that conveyed the value of continued employee development. Employees learned much more than just basic skills. They developed the attitudes and skills of responsible learners - learners who are more flexible and open to the changing demands of the work environment.

Post test results from the MAT, WAT, and TABE tests indicated that on average RCTs improved both information processing skills and math skills. Because basic skills were strengthened, individuals were prepared to attend and/or challenge out of the DOE

Rad Con training. Challenge test results are noted in the appendix. Of the 93 RCTs who completed the basic skills program, an average of 70% have either completed or tested out of each unit in Phase I DOE training. Complete results for the remaining RCTs will be forthcoming. Comments on the follow-up survey also indicated the usefulness of the training in helping prepare RCTs for mandated Rad Con training.

Partnering with a national laboratory to provide a skills enhancement program to employees prior to attending mandated training was a new direction for Merex. The experience was a good one and the opportunity to provide this program was greatly appreciated.

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