**Evaluation of P-101 Course
"Orientation to Occupational
Safety Compliance in DOE"
Taught in Richland, Washington**

April 2 - 12, 1991

R. W. Vinther

May 1991

**Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830**

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under Contract DE-AC06-76RLO 1830

Printed in the United States of America

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EVALUATION OF P-101 COURSE
"ORIENTATION TO OCCUPATIONAL SAFETY COMPLIANCE
IN DOE" TAUGHT IN RICHLAND, WASHINGTON
APRIL 2, 1991 - APRIL 12, 1991

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Richland, Washington 99352

SUMMARY

This report summarizes trainee evaluations for the DOE Safety Training Institute's course, "Orientation to Occupational Safety Compliance in DOE", which was conducted April 2, 1991 - April 12, 1991 at Richland, Washington.

The first part of the report summarizes the quantitative course evaluations that trainees provided upon completion of the course and provides a transcript of the trainees' written comments in Appendix A. The second part summarizes results from the trainee knowledge survey and the final examination designed to measure the knowledge gained from the course. The third part of the report summarizes course modifications and recommendations for improvement.

Numeric course ratings were generally positive and show that the course material and instruction was very effective. Written comments supported the positive numeric ratings. The course content and knowledge gained by the trainees exceeded most of the students' expectations of the course.

Examination results on the final examination showed a vast improvement from the scores on the trainee knowledge survey (pre-test) that was administered on the first day of the class.

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1.0 SUMMARY OF TRAINEE COURSE EVALUATIONS

This course was conducted at PNL's Information Services Building (ISB) in Richland, Washington. Three instructors and a course administrator presented the course to seven (7) Hanford contractor employees.

1.1 NUMERIC RATINGS

Seven trainees completed a course evaluation form upon finishing the course. The first rating area of the form covered five (5) items dealing with course content; the second rating area covered three (3) items dealing with testing materials; and the third rating area covered thirty-one (31) items specifically associated with course topic areas.

For the first and second rating areas, respondents were instructed to rate the degree to which they agreed or disagreed with each statement using a five-point scale with 1 (low) and anchored to "strongly disagree" and 5 (high) anchored to "strongly agree". The ratings are as follows:

COURSE CONTENT RATINGS

1. Developed specific skills and competencies in occupational safety compliance that I can use on the job.

Average Class Rating - 4.71

2. Gained a greater understanding of 29 CFR 1910, Occupational Safety and Health Standards.

Average Class Rating - 4.71

3. Gained factual knowledge about Federal safety and health program requirements.

Average Class Rating - 4.14

4. Would recommend this course to others.

Average Class Rating - 4.86

5. Compliance knowledge gained from this course will make work environments safer.

Average Class Rating - 4.57

The average class rating for the course content area was 4.60. This high rating reinforces the applicability of the course content to the trainees' interests and work environments.

TESTING MATERIALS

1. The final test was a good measure of the knowledge gained in this course.

Average Class Rating - 4.00

2. The final test (and pre-test) thoroughly covered materials and instruction presented in the course.

Average Class Rating - 3.50

3. The final test (and pre-test) should become a permanent part of this course.

Average Class Rating - 4.33

The average class rating for the testing material was 3.94. Trainees felt that the testing material was applicable and a good measure of what was presented. Some felt that the final test could be improved.

The third rating area asked the respondents to rate the value of each of the 31 topic areas using a five-point scale with 1 (Unsatisfactory), 2 (Satisfactory), 3 (Good), 4 (Very Good), or 5 (Excellent). The following are the average class ratings that dealt with topic content as well as with the value of the instructor:

TOPIC AREA RATINGS

<u>Topic Area</u>	<u>Content</u>	<u>Instructor</u>
1. Introduction to DOE Safety and Health Program	4.00	4.29
2. Introduction to OSHA standards	4.14	4.43
3. Hazardous Materials -- flammable and combustible materials	4.29	4.57

TOPIC AREA RATINGS (contd)

<u>Topic Area</u>	<u>Content</u>	<u>Instructor</u>
4. Materials Handling and Storage	3.83	4.17
5. Means of egress	3.86	4.00
6. Fire Protection	4.33	4.33
7. Compressed gas/air equipment	4.00	4.33
8. Welding, cutting and brazing	3.71	4.14
9. Electrical Safety	3.71	4.29
10. Machine guarding	4.33	4.50
11. Lock out Tag out (LOTO)	3.71	4.14
12. Hand and portable tools	4.20	4.33
13. Construction safety	3.71	4.00
14. Walking-Working Surfaces	4.00	4.33
15. Powered platforms	4.00	4.17
16. Toxic and hazardous substances	4.57	4.71
17. Carcinogen policy and model standards	4.67	4.67
18. Material Safety Data Sheets (MSDS)	4.14	4.57
19. Laboratory Safety	4.14	4.57
20. Personal protective equipment	4.14	4.14
21. Medical and first aid	3.83	4.50
22. Occupational health and environmental control	4.17	4.33
23. Confined space entry	3.50	3.83
24. General and environmental controls	3.83	4.33
25. OOE accident/injury/illness reporting system	3.86	4.14
26. Accident investigation procedures	4.00	4.43
27. Inspection responsibilities and procedures	4.33	4.50

TOPIC AREA RATINGS (contd)

<u>Topic Area</u>	<u>Content</u>	<u>Instructor</u>
28. Introduction to communications and human relations	3.83	4.33
29. Safety inspection field exercise	3.67	3.67
30. Presentation workshop, Part I	3.43	3.43
31. Presentation workshop, Part II	3.57	3.57

The overall average class rating for specific topic content was 3.98. The overall average class rating for the instructors in general was 4.25.

1.2 WRITTEN COMMENTS

After providing numeric course evaluations, participants provided written comments about the course. Written comments were transcribed and are presented in their entirety in Appendix A and are summarized below.

Expectations

Trainee expectations were generally met or exceeded. Participants received a better understanding of the applicability of OSHA requirements and how to find them.

Most helpful topics

The general overview of occupational safety was very helpful, especially to those with limited safety backgrounds. Discussion and lecture on OSHA requirements and inspection responsibilities were found to be very helpful.

Least helpful topics

Some of the attendees felt that the short presentations given by the trainees at the end of the course were not necessary as part of the course. One individual felt that the tour was least helpful because the scope of the compliance check was "overwhelming".

Suggestions for improvement

Trainees suggested that the tour facility "tour" could be better organized or narrowed in scope. Facility investigations might focus on one type of

facility for each session. Comments were made that it would be helpful to participate in more directed site facility inspections.

Some of the trainees also felt that casual conversation during the lectures should be tightly controlled.

Other types of training courses

More specific topics in industrial safety and hygiene as well as hazard/violation type workshops were mentioned as other types of safety training courses that students would like to see available in the future.

Other comments

Small-sized classes were favored for the interaction involved in this type of course.

1.3 EXAMINATION RESULTS

Two tests were administered in this course. On the first day, a trainee knowledge survey (pre-test) was taken by six (6) trainees. On the last day of the course, a final examination was administered to seven (7) trainees. Summaries of the examinations (survey) results are shown below:

1.3.1 Trainee Knowledge Surveys

Six (6) trainees took the twenty-five (25) question trainee knowledge survey. There were twenty-three (23) multiple choice questions and two (2) questions that required the trainees to list the appropriate answers.

The scores ranged from 24% to 56% with the average score being 40%. Of the twenty-five (25) questions asked on the survey, five (5) of the questions were missed by all trainees.

1.3.2 Final Examination

Seven (7) trainees took the thirty-five (35) question final examination. The test was comprised of twenty-one (21) new questions and fourteen (14) questions from the trainee knowledge survey given on the first day of class. There were twenty-eight (28) multiple choice questions and seven (7) questions that required the trainees to list the appropriate answers.

The scores ranged from 81% to 100% with the average score being 91%. Of the 35 questions asked on the final examination, no question was missed by all of the trainees. One question was missed by four of the trainees.

2.0 SUMMARY OF COURSE

2.1 NUMERIC RATINGS

Numeric course ratings provided by trainees were generally positive and show that the course material and instruction was very effective.

The average class ratings for individual questions associated with the applicability of course content ranged from 4.14 to 4.86. The overall average class rating for the course content area was 4.60. This high rating reinforces the applicability of the course content to the trainees' interests and work environments.

The average class ratings for individual statements concerning the effectiveness of the testing materials ranged from 3.50 to 4.33. The overall average class rating for the testing material was 3.94. In general, trainees felt that the examinations were applicable and an adequate measure of what was presented in the class.

Specific topic areas were rated as to the value of content as well as the value of instructor ability. Average class ratings for specific topic area content ranged from 3.43 (Presentation Workshop, Part I) to 4.67 (Carcinogen policy and model standards). The overall average class rating for topic content was 3.98.

The average class ratings for instructor ability ranged from 3.43 (Presentation Workshop, Part I) to 4.71 (in the area of Toxic and hazardous substances). The overall average class rating for the instructors was 4.25.

2.1.1 Written Comments

Training materials presented and knowledge gained by the trainees exceeded most of the students' expectations of the course. The small class size was appreciated by trainees as it allowed for good interaction between students and instructors. Trainees felt that the class was interesting, applicable to their needs and was well worth the time and effort. Most would highly recommend this course to others who needed OSHA compliance familiarity. Written comments supported the positive numeric ratings.

2.1.2 Examinations

Examination results showed a vast improvement in scores from the trainee knowledge survey to the final examination. The scores on the final examination showed an average improvement of 51 percentage points from the average scores of the trainee knowledge survey. Trainees indicated that maintaining similar tests in the future would be a good measure of the effectiveness of the training course.

3.0 RECOMMENDATIONS/PROPOSED COURSE MODIFICATIONS

The course was viewed as successful by trainees as well as by the instructors and the course coordinator. Field exercises (inspections) should continue to be integrated into future courses. However, some comments were made that the inspection exercise (tour) was too broad in scope and it may have been more appropriate to focus in on fewer and more specific compliance issues. Thought should be given to either descope the field exercise or perhaps have more than one inspection (on different days) but on a much smaller scale. In general, trainees felt that additional time should be spent on organizing this portion of the course.

More illustrations/examples of OSHA violations should be added to the course as well as presenting material specific to DOE facilities. Interpretation of some of the OSHA regulations (29 CFR 1910 and 1926) might be enhanced by increased discussions of any applicable past court rulings. Further thought should be given as to the purpose of the Presentation Workshops and how they are presented. The student presentations potentially have been a negative impact in that some students may have felt intimidated by the thought of "making a presentation".

All numeric average class ratings were 3 (Good) or higher. The average class ratings that were under 4 (very good) indicate that improvements could be made in those topic areas which are listed below:

- Materials Handling and Storage
- Means of Egress
- Welding, cutting and brazing
- Electrical Safety
- Lock out Tag out
- Construction Safety
- Medical and first aid
- Confined space entry

- General and environmental controls
- DOE accident/injury/illness reporting system
- Introduction to communications and human relations
- Safety inspection field exercise
- Presentation Workshops, Parts 1 and 2

Trainee evaluations and verbal feedback indicate that additional courses should be considered for development by the Safety Training Institute in the following areas:

- Specific areas of industrial safety and hygiene
- Hazard/violation workshops

APPENDIX A

TRAINEE EVALUATION FORM
"ORIENTATION TO OCCUPATIONAL SAFETY COMPLIANCE IN DOE"
APRIL 2, 1991 - APRIL 12, 1991--RICHLAND, WASHINGTON

EVALUATION COMMENTS

APPENDIX A

TRAINEE EVALUATION FORM
"ORIENTATION TO OCCUPATIONAL SAFETY COMPLIANCE IN DOE"
APRIL 2, 1991 - APRIL 12, 1991--RICHLAND, WASHINGTON

EVALUATION COMMENTS

Please briefly describe how your expectations of this course were or were not met.

I really got up to speed on how and where to check Industrial Safety requirements.

Expectations were met as far as training materials and exercises.

Much more instruction than I had expected.

The course gave me a better understanding of where the requirements were coming from and how to find them.

Expected to be more specifically applicable to 1960 rather than 1910, but if that is what we will need to be trained to then all my expectations were exceeded.

The most helpful topics covered or activities presented in this course were:

The flavor of a general overview was most helpful to me, as I have no Industrial Safety background; I liked the workshop and presentations, especially.

Hazardous Subpart H

Bldg Codes

OSHA Requirements and Inspection Responsibilities

Material Handling and Storage

Total Course

The least helpful things discussed or done were:

The actual tour was unfortunately, the least helpful in terms of my learning process. The scope of our individual areas regarding compliance was overwhelming; I found it nearly impossible to look at all the various areas of compliance on the tour.

Accident investigation and reporting. I have had previous training in this field.

Presentation in my case only.

The 3 minute and 5 minute presentations.

More emphasis should be given to:

Organizing the tour

Interpretation of some of the CFR. How have the courts ruled?

Hazard materials chemical hazards

Actual Facility Investigations Focus on one type of facility for each session.

Radiological Standards

Hanford Site Regulations

Less emphasis should be given to:

Radiological Standards

Class Presentations

Casual conversation during the lectures

Non-governmental industrial safety

What I had hoped would be covered but wasn't mentioned was:

Relative importance of each area of industrial safety based on hazard consequences, this was actually discussed very briefly (by Carl) and informally.

**What specific suggestions do you have for improving future sessions?
What the presenters might do?**

Use more up to date slides and present material specific to DOE Nuclear Facilities.

What the participants might do?

Participate in more directed site/facility inspections.

Provide one full day of review prior to test, have at least one inspection a day.

Other materials to supplement or substitute for the provided handouts?

Some supplementary materials were discussed as being helpful by the presenters.

Include data on how to get CFR's and updates of these manuals.

Handouts confusing as to location

Make an actual, standard vs. DOE order comparison

Daily schedule/timing of activities, worktime?

excellent

Facilities/training room arrangements?

Facility should allow and encourage student interaction and not be real formal.

What other types of safety training courses would you like to see available?

Follow up to this course in specific areas of industrial safety and hygiene.

The Hazard/Violation work shop is good introduction to get people into the manual.

Any further comments?

Keep classes small less than 15 for interplay between students and instructors.

APPENDIX B

TRAINEE EVALUATION FORM

TRAINEE EVALUATION FORM

Orientation to
Occupational Safety Compliance in DOE

Date _____
Name _____
Title _____

Please list your major job duties. _____

What do you expect to gain from this course? _____

Briefly describe your safety training within the last three years? _____

Please evaluate various features of the course you have just completed. Your comments will be kept confidential. The information you provide here will be combined with that from other trainees and summarized for the sponsor, the U.S. Department of Energy. Results from this evaluation will be used to improve this course.

Course Content	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Overall, as a result of this course I believe that I:					
developed specific skills and competencies in occupational safety compliance that I can use on the job.5	4	3	2	1	
gained a greater understanding of 29 CFR 1910, Occupational Safety and Health Standards.5	4	3	2	1	
gained factual knowledge about Federal safety and health program requirements5	4	3	2	1	
would recommend this course to others.5	4	3	2	1	
compliance knowledge gained from this course will make work environments safer.5	4	3	2	1	

Testing Materials	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
The final test was a good measure of the knowledge gained in the course.5	4	3	2	1	
The final test (and pre-test) thoroughly covered materials and instruction presented in the course.5	4	3	2	1	
The final test (and pre-test) should become a permanent part of this course.5	4	3	2	1	

Topic Areas

Please evaluate each topic area using the 5-point scale below.

5 Excellent 4 Very Good 3 Good 2 Satisfactory 1 Unsatisfactory

	Content					Instructor				
Introduction to DOE safety and health program	5	4	3	2	1	5	4	3	2	1
Introduction to OSHA standards	5	4	3	2	1	5	4	3	2	1
Hazardous materials—flammable and combustible materials	5	4	3	2	1	5	4	3	2	1
Materials handling and storage	5	4	3	2	1	5	4	3	2	1
Means of egress	5	4	3	2	1	5	4	3	2	1
Fire protection	5	4	3	2	1	5	4	3	2	1
Compressed gas/air equipment	5	4	3	2	1	5	4	3	2	1
Welding, cutting and brazing	5	4	3	2	1	5	4	3	2	1
Electrical safety	5	4	3	2	1	5	4	3	2	1
Machine guarding	5	4	3	2	1	5	4	3	2	1
Lock out Tag out (LOTO)	5	4	3	2	1	5	4	3	2	1
Hand and portable powered tools	5	4	3	2	1	5	4	3	2	1
Construction safety	5	4	3	2	1	5	4	3	2	1
Walking - Working surfaces	5	4	3	2	1	5	4	3	2	1
Powered platforms	5	4	3	2	1	5	4	3	2	1
Toxic and hazardous substances	5	4	3	2	1	5	4	3	2	1
Carcinogen policy and model standards	5	4	3	2	1	5	4	3	2	1
material safety data sheets (MSDS)	5	4	3	2	1	5	4	3	2	1
Laboratory safety	5	4	3	2	1	5	4	3	2	1
Personal protective equipment	5	4	3	2	1	5	4	3	2	1
Medical and first aid	5	4	3	2	1	5	4	3	2	1
Occupational health and environmental control	5	4	3	2	1	5	4	3	2	1
Confined space entry	5	4	3	2	1	5	4	3	2	1
General and environmental controls	5	4	3	2	1	5	4	3	2	1
DOE accident/injury/illness reporting system	5	4	3	2	1	5	4	3	2	1
Accident investigation procedures	5	4	3	2	1	5	4	3	2	1
Inspection responsibilities and procedures	5	4	3	2	1	5	4	3	2	1
Introduction to communications and human relations	5	4	3	2	1	5	4	3	2	1
Safety inspection field exercise	5	4	3	2	1	5	4	3	2	1
Presentation workshop, Part 1	5	4	3	2	1	5	4	3	2	1
Presentation workshop, Part II	5	4	3	2	1	5	4	3	2	1

Trainee Comments

Please briefly describe how your expectations of this course were or were not met. _____

The most helpful topics covered or activities presented in this course were: _____

The least helpful things discussed or done were: _____

More emphasis should be given to: _____

Less emphasis should be given to: _____

What I had hoped would be covered but wasn't mentioned was: _____

What specific suggestions do you have for improving future sessions.
What the presenters might do? _____

What the participants might do? _____

Other materials to supplement or substitute for the provided handouts? _____

Daily schedule/timing of activities, worktime? _____

Facilities/training room arrangements? _____

What other types of safety training courses would you like to see available? _____

Any further comments? _____

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