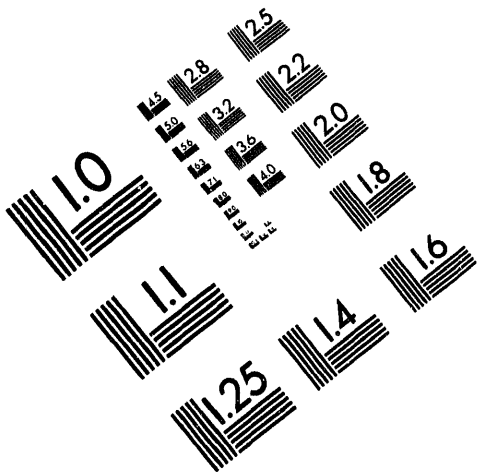

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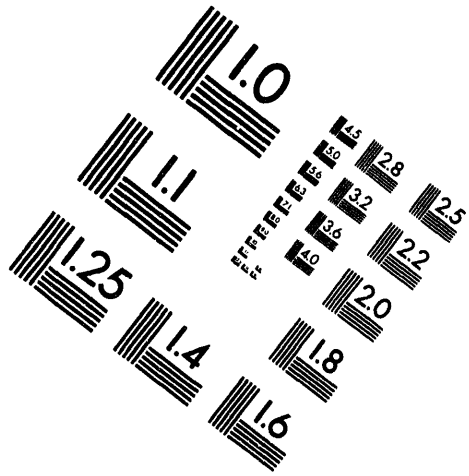

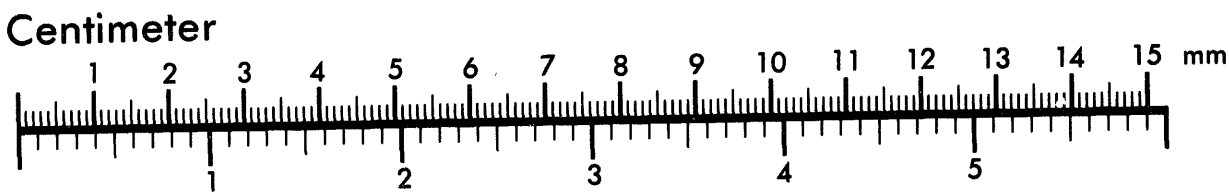

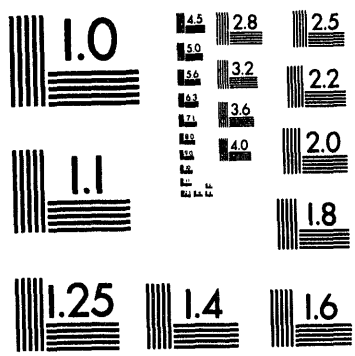

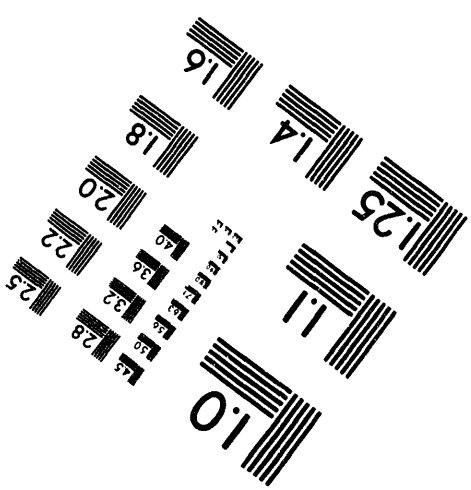

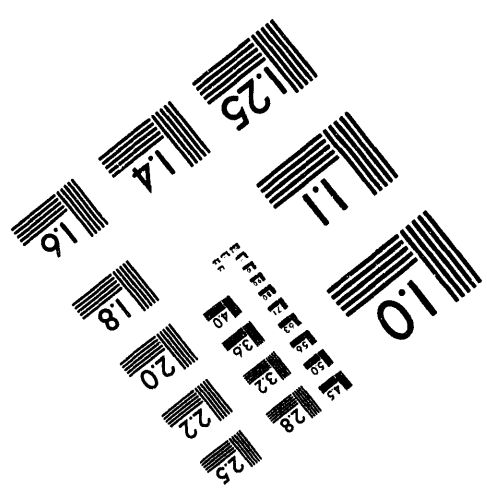

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THE U.S. DEPARTMENT OF ENERGY'S STUDENT VIDEO PROGRAM

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ABSTRACT

The Student Video Program was an educational outreach program intended to educate and involve high school students in environmental restoration and waste management issues. Through participation in this program the students were shown how science and math are related to these subjects. In addition, they were exposed to many different and interesting career opportunities.

I. INTRODUCTION

Waste management and environmental issues are growing concerns across the United States and around the world. The generation, treatment, and disposal of waste are problems that everyone must face. The need for highly trained, technical personnel is great if we are going to face these challenges in a safe, efficient and cost effective manner.

When speaking with young people today, it is evident they are unaware of career opportunities available in environmental fields. They understand about recycling and preserving natural resources and they have a true desire to do their part. However, most high school students in this country have had very little exposure to the "real" working world of science and industry. Consequently, when trying to decide "what they want to be when they grow up", this lack of exposure hinders their making important educational and career choices.

The National Science Foundation projects a shortage of one million professional scientists and engineers by the year 2010. If the United States is going to have enough trained people to meet our technological needs, we must find ways to stimulate students' interests in math, science, and engineering and show them that these are necessary skills to help preserve our environment.

II. BACKGROUND

The DOE Student Video Program evolved from a national rewrite program of the U.S. Department of Energy's Environmental Five-Year Plan. In 1991 and 1992 students from across the country were asked to evaluate the 737 page Five-Year Plan. They critiqued the text and graphics, and submitted their own versions and ideas of how the plan could be improved. The students and advisors showed much insight, and through their efforts, the Department of Energy was helped to develop a more readable version of the plan. A Student Edition of the Five-Year Plan was produced in early 1993.

With the Student Rewrite Program coming to an end, and with the goal of stimulating student interest in technological fields, the Student Video Program was developed by a team consisting of DOE Oak Ridge Field Office Staff and employees of Martin Marietta Energy Systems. Video appeared to be the logical choice for students born of the television generation. It was hoped through participation in the program an interest in math, science and "high tech fields" would be generated by showing students how these subjects relate to environmental matters.

The program's goal was for participating high schools to produce a broadcast-quality five minute video, on a topic of the students choice, and relating

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to the Five-Year Plan. The program was designed to encourage participation in many activities for completion of the video including: interaction with professional scientists, engineers, technicians and video production personnel; tours of Oak Ridge Reservation facilities related to their chosen topic; research and planning; script writing and narration; video taping and editing; and many other activities.

III. THE PROGRAM

To kick off the program, an informal meeting was held at an area high school in mid-January, 1993. The meeting provided information about the proposed Student Video Program. Seven area high schools were invited to attend in order to interest the students and faculty advisors, and to assure them that a video was something they were capable of producing.

The program was introduced, examples were shown of different video productions, a brief lesson was given on how videos are made, and there was a question and answer period. Of the seven high schools invited to the meeting, five high schools chose to participate in the Student Video Program. All of the schools that chose to participate had participated in the earlier rewrite program and were already familiar with the Five-Year Plan.

During the next two weeks, the program coordinator met with the participating schools individually to review the objectives of the Student Video Program. It was important to find out what the students interests were, and to help the group come to a decision about what topic they would like to pursue.

Choosing a topic was not always an easy task. The students had a variety of ideas, usually on a broad scale. It was difficult to focus on one topic or area that interested the whole group. When things seemed to get bogged down, suggestions were made by the program coordinator to help them zero in on a topic that would be acceptable to everyone.

Once the topics were chosen, the individual groups met weekly with the program coordinator, and as needed by themselves, to determine how they wanted the video to look, what information they wanted to share, and who in the group was going to be responsible for different tasks that go into making a video. The students were encouraged to work together as a team, with certain students taking on specific responsibilities such as research, writing, interviewing, editing or background music selection.

The program coordinator was responsible for: obtaining information for the students that was not easily accessible; making contacts with different professionals who could provide needed information or who could be interviewed; setting up tours of facilities for interaction with professionals that pertained to the groups' chosen topics; and scheduling and overseeing interviews, video taping, and editing sessions for each of the five schools.

IV. VIDEO TOPICS

A. New Technology Development, Can Our Educational System Meet The Needs?

Roane County High School located in Kingston, Tennessee chose to address new technology being developed that pertains to environmental clean-up. This topic proved to be an eye opener for the students. As they were exposed to some of the latest technology, they began to wonder how anyone was ever prepared to invent it. Thus the twist in the video " Can the educational system meet the needs?"

The students were not only exposed to some of the new technology being developed in environmental and waste management fields, they also investigated the educational system to find out how many high school students continue their education into scientific or technical fields.

To prepare for the video, the students interviewed a diverse group of professionals. Dr. Anthony Malinauskas, Director of The Office of Environmental Technology Development for Martin Marietta Energy Systems, was interviewed by the students. He informed them of the latest technology being developed to facilitate environmental clean-up. Dr. William Miller, Associate Dean of Engineering at the University of Tennessee, explained about different career opportunities available in engineering, and the education required. He encouraged young people from all walks of life to enter these professions so our country will have enough trained professionals to keep up with the demands of the technological era.

The video includes information on robotics, the swing free crane, and insitu-vitrification. It explores the educational system and discusses the projected shortages of well trained technical personnel and

encourages young people to plan for their future.

B. Safety Testing Of Containers Used In The Transportation Of Waste

Clinton High School is located in Clinton, Tennessee. Many of the students participating in the Video Program had been involved in the Five-Year Plan Rewrite Program. During the rewrite program, they had caught a glimpse of what was involved in testing containers used to carry waste, and decided they wanted to learn more about the processes involved.

Conveniently, just as the video program was starting, a drop test for container integrity was scheduled at Oak Ridge National Laboratory. Two students from Clinton were able to attend the drop test to see, first hand, how this process was accomplished. Video cameras were set up to capture the drop test on tape, and the students were able to interview many of the people involved in the test.

In addition, the students were curious about the different types of waste that the containers must hold. They learned about the different categories of waste and decided it was important to include this as part of their video.

The video includes information on the different waste categories, as well as information on the many tests that containers must pass in order to be approved to transport waste.

C. Mercury Contamination: East Fork Poplar Creek

Karns High School is located in Karns, Tennessee, a small community between Knoxville and Oak Ridge. This particular group of students was in an advanced placement chemistry class and decided to choose the topic: Mercury Contamination of East Fork Poplar Creek. The subject was of great interest to them, since it involved an area that is very close to home. East Fork Poplar Creek runs through the city of Oak Ridge and eventually flows into Watts Bar Lake, a near by recreational area.

The students researched the subject and developed a thorough understanding of the chemistry involved. They interviewed Dr. John Googin as part of their research. Dr. Googin was instrumental in the design and construction of the facilities, in Oak Ridge, Tennessee, that contained the mercury used in the COLEX process. He was very informative and spent quality time with the students explaining the history of the process, how it was developed and utilized, the resources needed for the construction of the facilities, how the mercury contamination happened, and his thoughts on the impact of the contamination to the environment, and possible solutions.

The video includes: a brief history on the COLEX process; information about the mercury releases, and the discovery of the mercury conversion in fish to methylmercury, which is harmful to humans; information on studies done on the aquatic life in East Fork Poplar Creek, and how their contamination impacts humans; and excerpts of the students' interview with Dr. Googin.

D. TRANSCOM: A Transportation Tracking And Communications System

Harriman High School located in Harriman Tennessee chose the topic of TRANSCOM. This was an interesting subject for the students. They learned about the latest technology in the transportation and tracking of waste as it's transported to storage sites in different areas of the country.

The students spent a lot of time at the TRANSCOM Center in Oak Ridge, Tennessee. They were shown how the TRANSCOM system generates information while tracking waste shipments being transported from one site to another. This information is available to the different states, agencies, and emergency personnel that are on line with the system, and keeps them up to date on the status and location of the waste being transported. The students learned how the equipment works and also learned how different agencies would respond in the event of an accident involving waste.

The staff at TRANSCOM was very cooperative, and really made an effort to teach the students how their technology works. The students came to understand what is involved to make waste transportation safe through the use of this effective tracking and communication system.

The video shows the TRANSCOM Center, explains how it works, and discusses why a network such as this is important for that transportation of waste.

E. The Legacy

Oliver Springs is a small, closely knit community located near Oak Ridge, Tennessee. The students at the high school have family and friends that were directly affected when Oak Ridge was built. This group of students had a definite vision for their video entitled, The Legacy.

The students wanted to show what their area was like before World War II. They wanted to convey the message of how the war and the Manhattan Project impacted the lives of people who lived in the area, and how we need to learn all we can about the generation, disposal and clean-up of waste in order to give future generations a worthwhile legacy.

The students interviewed many of their elders who lived in the area at the time of the war and the Manhattan Project. They delved into family photo albums and through the files at the DOE, Oak Ridge Field Office, Photography Center, looking for old photographs that portrayed what life was like before they were born. They learned about the environmental problems of the area and researched some of the technology and skills that are necessary to obtain solutions to these problems. They interviewed Dr. Herman Postma, former director of Oak Ridge National Laboratory, about how the facilities at Oak Ridge will continue to impact the area.

After completing their research, they were able to state their message in an eloquent and visually stimulating way. The video includes: history on the area before World War II, with pictures and music indicative of the era; information on the impact of the Manhattan Project; concerns about waste generation, treatment, and disposal; and encouragement to young people to make a positive contribution to the legacy of future generations.

V. CONCLUSION

The response to the video project has been significant. In addition to working with high school students and providing them with the opportunity to learn many new and interesting things, we produced a broadcast quality, public information video by combining the efforts of all of the high schools involved.

The students enjoyed the program and were excited when they viewed the final results. There was a great deal involved to bring the individual school projects to completion. They were amazed at what they were able to produce, which made them realize, that with a little hard work and effort, they are able to accomplish whatever they set their minds to. In addition, we now have an excellent public information video that has been shown on cable television. The video is also available for schools, so that more students can be exposed to some of the opportunities that are available in technical fields.

Over seventy students were involved with the production of the video. The schools that they attend, in general, do not have the best facilities, or up to date equipment. A program such as this helps to expose students from a more rural area to opportunities that would not normally be available. The students put forth a great deal of effort, and are to be commended for their work, most of which was done on their own time.

The professionals who worked with the students, and taught them the necessary information and skills that made the video a reality, made an important impact. Each one of the students walked away with knowledge and experience that cannot be learned in a classroom. The professionals involved were also stimulated and rewarded by the excitement, questions, and new ideas that were generated during their interaction with the students. The combined efforts of everyone involved produced a video that is both informative and interesting. The video creates a public awareness of the on-going problems that we face with waste management and environmental issues, and makes us recognize that we all must be part of the solution.

ACKNOWLEDGEMENTS

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