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COVER SHEET

Program Proposals

Name(s) of Persons Submitting Proposal _____

Title of Project Decreasing Occupational Knee Injuries Due to Running Among
Security Police Officers for the Department of Energy: A Program Proposal

Setting(s) of Project/Target Population(s) Security Police Officers for contractors
for the Department of Energy at the Pantex Nuclear Weapons Facility in
Amarillo, Texas and the Nevada Test Site in Mercury, Nevada

Abstract (must fit in space below):

Macera et al (1989) have reported that a review of the literature indicates that the annual rate of knee injuries for runners ranges from 24% to 65%. Clement et al (1981) report that injuries to the knee account for 41.7% of the injuries that runners suffer. This program proposal addresses the occupational knee injuries resulting from running that occur during paid exercise sessions among Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada. During the time period of January 1 through December 30, 1995 this program will decrease the number of knee injuries by 25% compared to 1994 numbers. Behavioral objectives, based on a review of the literature, have been developed to limit the Security Police Officer's frequency and duration of running during paid exercise sessions. Environmental objectives have been developed to address the policy issues in meeting the behavioral objectives. Educational goals and strategies have been developed to increase knowledge and awareness regarding the issues involved. Also included with this is a summary of tasks with personnel responsibilities, a time line for the accomplishment of the tasks, and a budget to carry out the tasks to meet the objectives. Lastly, evaluation of the program and dissemination of the program and its results is discussed as part of the program proposal.

Macera et al (1989) have reported that a review of the literature indicates that the annual rate of injuries for runners ranges from 24% to 65%. Clement et al (1981) report that injuries to the knee account for 41.7% of the injuries that runners suffer. Over the past three years, the number of occupational knee injuries among Security Police Officers for the Department of Energy as a result of running during paid exercise sessions has increased dramatically. There have been several reasons for this; as a result, the purpose of this request for funding application is to develop a program to address some of these issues.

Program Goal:

The number of occupational knee injuries as a result of running during paid exercise sessions will be reduced among Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada.

Security Police Officers (SPOs) are required to pass annual physical fitness standards; consisting of the completion of a 40-yard dash in either 8.5 seconds or 8.0 seconds as well as either a half-mile run in 4:40 or a mile run in 8:30 depending upon job classification, in order to remain qualified for employment. Failure to complete the entire standard can result in the SPO being placed in a lay off status until the entire standard can be met. SPOs are required to participate in on-duty exercise sessions three days per week and have the opportunity to participate in paid off-duty exercise sessions if an on-duty session is missed due to operational requirements. A permanent restriction that does not allow the SPO to participate in the exercise program can result in a medical retirement for the SPO, if he or she is unable to fill another vacancy within the contractor's organization. All exercise sessions are supervised by exercise physiologists and loosely enforced policies are in place regarding the duration and intensity of exercise that an SPO can perform. Even so, the number of occupational knee injuries requiring work limitations, time missed from work, and/or surgery continues to rise by approximately 15% each year, according to information obtained from each contractor's Environmental Health and Safety Department.

This rise in the number of occupational knee injuries causes workers' compensation insurance premiums paid by the contractors to steadily increase by tens of thousands of dollars annually. In addition, interviews with SPOs reveal that these injuries or risk of these injuries adversely affects their quality of life as they are concerned about passing their annual physical fitness standards and thus remaining employed; being able to play with their young children; being able to participate in activities that they enjoy outside of work; and being able to do chores

around the home.

Program Objective:

During the time period of January 1 through December 30, 1995, the number of occupational knee injuries among Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada will be decreased by 25% compared to 1994 numbers.

The behaviors to be addressed by this program because of their changeability and importance are: constant high-intensity training without alternate low-intensity days and running at a high exercise intensity as indicated by heart rate for 45 minutes or more. These behaviors are highly changeable within this population because they can be controlled by individual Security Police Officers and the exercise physiologists that supervise them. The literature review shows that these behaviors are important in trying to reduce the incidence of knee injuries occurring related to running as these behaviors are significantly related to the occurrence of knee injuries related to running.

Behavioral Objectives:

1. By December 30, 1995, 95% of all Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada will participate in low impact aerobic activities; i.e., non running, at least one time per week.
2. By December 30, 1995, 95% of all Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada will limit their running durations each exercise session to 30 minutes.

One environmental risk factor identified is the lack of a comprehensive progressive disciplinary plan to be followed when exercise programs and/or restrictions are not adhered to. Another environmental risk factor that has been identified through a review of each contractor's personnel policies and the Department of Energy's Designated physician's policies on SPOs returning to work is that there is no policy encouraging the communication between the designated physician for the Department of Energy and the personal physician for the SPO, who completed the SPO's recent knee injury. Both of the identified environment risk factors will be addressed in this program. Through the interviews with the exercise physiologists, it has been determined that both of the identified environmental risk factors play a significant role in decreasing the number of knee injuries

occurring as a result of running during paid exercise sessions. In addition both of these risk factors are very changeable through modification of current policy governing these issues.

Environmental Risk Factor Objectives:

1. Through a collaborative effort between contractor management, field force supervision, the union representing the field force, and the exercise physiologists, a comprehensive and progressive disciplinary plan will be developed and enforced to handle lack of adherence to exercise programs and/or restrictions during paid exercise sessions. This plan will be developed by June 1, 1995 and implemented by September 1, 1995.
2. The designated physicians for the Department of Energy and the exercise physiologists, together in consultation with an orthopaedic surgeon, will develop a form for SPOs to take to their physicians to specifically outline any and all exercise and work restrictions that an SPO should have upon returning to work after recent knee surgery. This form will be developed by September 1, 1995 and implemented by December 1, 1995.

In trying to address the program and behavioral objectives, there have been some underlying factors that have been identified which impact the ability to address these objectives. These factors are educational in nature and are divided into predisposing, enabling, and reinforcing factors.

The predisposing factors to be addressed by this program will be the belief that running alone is the only way to keep in shape to pass their annual physical fitness standards and the belief that low impact aerobics are not very useful in helping to keep them in shape. Both of these beliefs are not only widespread throughout this population, but are also related to the reduction in the number of incidents of knee injuries. Addressing these beliefs will help the SPOs understand why the first behavioral objective is critical to reducing the number of occurrences of knee injuries.

Interviews with the SPOs and the exercise physiologists deemed that the older exercise equipment in the facilities is a significant enabling factor and needs to be addressed. The SPOs state that they do not like to use the older pieces of equipment. If given a choice, they would rather use a treadmill than an older piece of equipment. In order for the first behavioral objective to be met, this factor is a key. Without enough equipment, SPOs will not be able to perform the required low impact aerobic activities.

To best provide reinforcement of the new behavior change with this target population, it has been determined from past experience that the SPOs respond best when assigned to an exercise physiologist on staff. This

exercise physiologist will monitor the SPO's progress and provide as much reinforcement as possible. The SPO will also know who is especially familiar with their chart and whom they could consult with should they have any questions.

Educational and Organizational Objectives:

1. By September 30, 1995, there will be a 50% decrease in the beliefs among Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada that running alone with no participation in low impact aerobics is the only way to get into and/or remain in shape to pass the annual physical fitness standards. (Objective to meet the predisposing factor.)
2. By July 1, 1995, 75% of all older low impact aerobic exercise equipment will be completely phased out of all the exercise facilities at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada and newer equipment will be purchased for use. (Objective to meet the enabling factor.)
3. By July 1, 1995, all Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada will be assigned to a staff exercise physiologist who will monitor and reinforce progress. (Objective to meet the reinforcing factor.)

It has been found through previous programs that posters and signs on bulletin boards in the exercise facilities and other common areas, lectures during training classes throughout the year, articles in the company and union newsletters, messages on paychecks, fliers enclosed with paychecks, and individual counseling are among the most effective ways of meeting the educational needs of this target population. Activities planned outside of work generally automatically exclude one shift from even considering participating without having to take some form of leave. In addition, for shifts getting off work that day, their day would be extended from a 14-hour day (12 hour shift plus travel) to 16 or more hours. This leaves little time for the SPO to spend time with their family and/or prepare for the next day of work.

Educational and Organizational Strategies:

I. Predisposing Factor

A. Bulletin Boards

- Posters showing ways that low impact aerobic activities can be done in the facilities while still keeping in shape to pass the annual physical fitness standards.

- Posting pictures on the bulletin boards of those SPOs who passed the annual physical fitness standards and performed low impact aerobic activities at least one time per week.

-Signs on the bulletin boards stating the significance of performing low impact aerobic activities in the reduction of the occurrence of knee injuries.

B. Lecture During the Protective Force Annual Training

-All SPOs attend this and will hear the message that low impact aerobic activities are crucial.

C. Articles in the Company and Union Newsletter

-In addition to the exercise physiologists writing some of these articles, local orthopaedic surgeons and physical therapists would be asked to contribute on this subject.

D. Individual Counseling by the Exercise Physiologists and/or the Department of Energy Designated Physicians as Necessary

2. Enabling Factor

A. Coordination of the Purchase and Removal of Equipment

3. Reinforcing Factor

A. Exercise physiologists will provide bimonthly reports to the SPOs which are assigned to them and to the manager of the Training Department. These reports will summarize their exercise activity, indicate areas that need to be adjusted to reduce their risk of a knee injury, and provide reinforcement for the changes made.

B. SPOs will be able to consult with their assigned exercise physiologist who is familiar with their exercise record for any possible reinforcement.

4. Environmental Risk Factor

A. Organize representatives of contractor management, field force supervision, the union representing the SPOs, and the exercise physiologists to meet, develop, and disseminate a comprehensive and progressive disciplinary plan.

B. Organize representatives of the designated physicians for the Department of Energy, contractor management and the exercise physiologists to develop a form to elicit all exercise and work limitations on SPOs.

In order for all of the objectives to be met, a time line has been developed for accomplishing tasks to meet the objectives. On the next page can be found a copy of the time line for accomplishing the tasks.

TIME LINE FOR ACCOMPLISHING TASKS TO MEET PROGRAM OBJECTIVES AND STRATEGIES

ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Bulletin Boards -posters and signs -pictures of SPOs	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X
Lecture to SPOs during Annual training -develop lectures -train exercise physiologists -present during training			X	X	X	X	X					
Articles for the Newsletters	X	X	X	X	X	X	X	X	X	X	X	X
Individual Counseling -Train exercise physiologists and designated physicians	X	X	X	X	X	X	X	X	X	X	X	X
Purchase New Equipment		X	X	X								
Removal of Old Equipment				X	X	X						
Exercise Programs -develop form for programs -train exercise physiologists -educate SPOs -write exercise programs for SPOs -implement		X	X X			X	X	X	X	X	X	
Develop Discipline Plan -meetings to develop -approval -educate employees and disseminate -implement	X		X		X		X	X	X	X	X	X
Develop forms for limitations -meetings to develop -approval -educate and disseminate -implement		X		X		X		X	X	X	X X	X

Capacity:

A variety of personnel within and outside of the organization of the contractors that provide security services for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada is needed to successfully implement this program. For this particular program,

_____, M.S. from Columbia, SC will work on a consultant basis as program coordinator. _____ will be responsible for training existing staff employed with the contractors to carry out the objectives of this program. In particular, local exercise physiologists will be trained on the key points to include on their bulletin boards and newsletter articles, key points that must be made during the lectures to the SPOs during their annual training, and the proper development and writing of exercise programs that will address the objectives of this program. She, with the help of each contractor's staffs, will also coordinate any tasks which involve the local Department of Energy designated physicians. The managers of each contractor's Training Department will coordinate with _____ the purchase of new exercise equipment. Regarding the development of the comprehensive and progressive discipline plan, _____ will ensure that the plan does not conflict with the objectives of the program. _____ will also ensure that the form that the SPOs are suppose to give their personal physician to determine any and all exercise and work limitations, is developed, implemented, and used. She will oversee and provide assistance to ensure that all objectives are met on a timely basis. See the next two pages for the list of key personnel and their biographical sketches.

The following is a list of resources required to implement this program to meet the objectives. Also included within this list is whether these resources are available within the contractor's organization.

<u>Resource Required</u>	<u>Availability</u>
1. Time	-This program will mostly require restructuring of current job descriptions.
2. Money	-Matching funds are available to purchase exercise equipment.
3. Office Supplies	-Basics are available.
4. Educational Materials for SPOs	-Need to be purchased.
5. Research Materials for the Exercise Physiologists to Use To Develop Materials, Posters and Signs.	-Need to be purchased.
6. Polaroid Camera and Film to Take Picture of SPOs Passing their Physical Fitness Standards.	-Need to be purchased.
7. Computers with Word Processing Programs	-Available
8. Fax Machines	-Available
9. Preprinted Forms and Bound Copies	-Need to be purchased.
10. Exercise Equipment	-Need to be purchased.
11. Staffing	-Available, except for consultant fees.
12. Travel and Hotel for	-Need to be paid for. Contractors will pay a per diem for her while in their city

Key Personnel

<u>Name</u>	<u>Role in Project</u>	<u>Level of Effort</u>
	Program Coordinator	100%

Biographical Sketch

Name _____

Current Position Student in Doctor of Public Health Program in Health

Promotion and Education at the University of South Carolina-Columbia, SC

Education:

Master of Science in Physical Education concentration in Sports Physiology and Adult Fitness from Ohio University in Athens, Ohio

Bachelor of Science in Kinesiology from the University of Michigan in Ann Arbor, Michigan

Relevant Experience:

Worked as a Physical Fitness Instructor with Wackenhut Services, Inc. in Las Vegas, Nevada from February 1992 to April 1995. Duties included:

- coordinating the development and implementation of Wellness Program for all personnel and their families to meet health and wellness needs
- administering the Department of Energy physical fitness qualification test to all armed security personnel
- supervising personnel exercise sessions and providing appropriate feedback
- developing exercise programs based on fitness level and/or medical restrictions
- providing physical fitness and health education and counseling to all armed security personnel
- serving as Company Coordinator for community and charity events.

Was commended by the Department of Energy for meritorious achievement. Held government security clearance which allowed potential access to classified information.

13. Long Distance Phone Charges

working.
-Need to be paid for.

The next page is the budget for the items which will need to be purchased and its justification is as follows. Ms. [redacted] was selected for coordinating this program based on her previous work experience in this field with similar population and her educational background. It was agreed between the contractors and herself what her consultant fee would be and that she would be compensated for her travel related expenses and her long distance phone charges. Contractors chose to develop the program this way, so that an additional employee would not have to be hired with full benefits and security clearance background check. The research materials to be purchased are to provide reference materials for the exercise physiologists to use to develop educational materials, posters, signs, and lectures to meet the educational objectives. The educational materials to be purchased will supplement existing materials to meet the educational objectives. One of the educational strategies to meet the educational objectives is to take pictures of SPOs that passed the annual physical fitness standards while incorporating low impact aerobic activities into their exercise routines and post those pictures on the bulletin boards. The purchase of the Polaroid camera and film will allow for this. The long distance phone charges to be paid are to provide reimbursement to [redacted] and the contractors for their communications during the program. Preprinted forms will be needed for the SPOs to take to their personal physicians to elicit specific work and exercise restrictions to meet the environmental objectives. Preprinted forms are also needed for the exercise programs to be written on so that a copy will be kept in the SPOs chart and another will be given to the SPOs for their personal files in order to meet the behavioral objectives. Because the SPOs are represented by unions, copies of any changes to policy are required to be given to all employees. Consequently, bound copies of the disciplinary plan will be needed for distribution to all employees in order for the environmental risk factor objectives to be met. Additional office supplies such as construction paper, overheads, and poster board will need to be purchased to make posters and signs to meet the educational objectives. The purchase of new exercise equipment is a key to this program. The availability of additional exercise equipment will directly impact the behavioral objectives upon which this program is based.

Potential barriers to the success of this program have been identified. Among these barriers are the lack of support from the exercise physiologists, the supervisors of the SPOs and/or the unions representing the SPOs. This barrier can be overcome by bringing all of the groups into the process from the beginning of the program and keeping them abreast of the progress of the program. Another potential barrier is the lack of cooperation by the Department of Energy's designated physicians and/or the SPOs personal physicians. With the Department of Energy's designated physicians, an atmosphere of cooperation will be fostered early in the program by selling the importance of the success of the program. With the SPOs personal physicians, a letter

BUDGET

<u>Itemized Expenditures</u>	<u>Amount</u>
Personnel	
Consultant Fees for	\$5000.00
Travel	
Airfare for from Columbia, SC to Las Vegas, NV then to Amarillo, TX and back to Columbia, SC (eight trips at \$700.00 per trip)	\$5600.00
Hotel (32 nights at \$60.00 per night)	\$1920.00
Supplies and Materials**	
Research Materials	\$500.00
Educational Materials	\$1500.00
Polaroid Camera and Film	\$200.00
Long Distance Phone Charges	\$250.00
Pre-Printed Forms	\$1000.00
Bound Copies of the Discipline Plan	\$1500.00
Office Supplies	\$400.00
Exercise Equipment***	
2 StairMasters @ \$2000.00 each	\$4000.00
8 LifeCycles @ \$1000.00 each	<u>\$8000.00</u>
Total Requested	\$29,870.00

**The money in these categories will be split so that half will be used at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the other half will be used at the Nevada Test Site in Mercury, Nevada.

***Each contractor will match the amount of money provided to purchase exercise equipment.

Signatures

Date: Nov. 15, 1995

stating the purpose of the form will be given to them along with the form. It will be emphasized that if this form is not completed or returned, the SPO will not be allowed to work.

Evaluation:

Throughout the program year, process evaluation will be done by _____ and appropriate staff from each contractor to ensure that all strategies are being utilized to meet the outlined objectives. Among the data to be collected as part of the process evaluation include documentation on the posters and signs put up on the bulletin boards, list of who attended the lectures during the Protective Force Annual Training, copies of articles in the company and union newsletters, copies of bimonthly reports to SPOs, documentation of individual counseling with SPOs, minutes of meetings, copies of the discipline plan, and copies of the form that SPOs are to have their personal physician complete in order for them to return to work.

For the impact evaluation, a before and after design will be utilized with this population. To assess the behavioral objectives, the exercise physiologists will review the charts of the SPOs and provide appropriate feedback to _____ and the Training Department manager in January, August, and December 1995, and January 1996, as different phases of the program are implemented. The environmental objectives will be assessed by _____ and each contractor's Training Department manager by collecting final copies of the discipline plan and the form for the SPOs personal physician. Documentation of the use of these two items will also be collected as possible. For the educational objectives, the predisposing factor objective will be assessed in a pre- and post-test during the lecture during the Protective Force Annual Training. The enabling factor objective will be assessed by through the purchase and removal of equipment. The reinforcing factor objective will be assessed by providing lists of the SPOs assignments and copies of the bimonthly reports.

During January and February 1996, the outcome evaluation will be conducted by _____ in conjunction with each contractor's Training Department manager and Environmental Health and Safety staff. The Environmental Health and Safety Departments will track the number of knee injuries that occur during the time frame of this program. This number will be compared to the number obtained for the same time frame in 1994.

Dissemination:

Copies of the program with its results will be provided to the Department of Energy for their review and distribution to contractors at other facilities who did not participate in the original program and to the Department of Defense. A manuscript of the program with its results will also be written and submitted to Medicine and Science in Sports and Exercise, The Journal of Worksite Health Promotion, The Journal of

Occupational Health among others for publication. Abstracts will also be submitted for presentations at national and regional conferences of the American College of Sports Medicine, the Association for Worksite Health Promotion, and other organizations.

Summary:

In summary, this program addresses the occupational knee injuries resulting from running that occur among Security Police Officers for contractors for the Department of Energy at the Pantex Nuclear Weapons Facility in Amarillo, Texas and the Nevada Test Site in Mercury, Nevada. During the time period of January 1 through December 30, 1995 this program will decrease the number of injuries by 25% compared to 1994 numbers. Behavioral objectives, based on a review of the literature, have been developed. Environmental objectives have been developed to address the policy issues in meeting this objective. Educational and organizational goals and strategies have been developed to increase knowledge and awareness regarding the issues involved. Also included with this is a summary of tasks with personnel responsibilities, a time line for the accomplishment of the tasks, and a budget for the money requested to carry out the tasks to meet the objectives. Lastly, the evaluation of the program and the dissemination of the program and its results are discussed.

REFERENCES

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4. Marcera, C.. Lower extremity injuries in runners: Advances in prediction. Sports Medicine. 1992; Vol. 13, No. 1: 50-57.
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