1. VALIDITY OF APPROACHES

THE RESEARCH PROPOSAL'S OBJECTIVE TO DEVELOP A FLASH BLINDNESS SIMULATION TECHNIQUE TO PROVIDE PREDICTIONS OF [illegible] PERFORMANCE DECREMENT [illegible] CONDITIONS OF FLASH EXPOSURE

APPEARS REASONABLY FEASIBLE. [illegible] SIMULATION [illegible] FLASHES AT LOW ILLUMINATION LEVELS, THE PREDICTIVE EFFICACY OF THE SIMULATION WOULD BECOME MORE QUESTIONABLE AT HIGH LEVELS. ASSUMING THAT PERFORMANCE TASKS ARE CLEARLY GENERALIZABLE TO NOCTURAL SITUATIONS, WE ARE CONCERNED THAT SINCE NOCTURAL DAZZLE THRESHOLDS [illegible] HAVE NOT BEEN ESTABLISHED, AND THEREFORE THE INTENSITIES OF ACTUAL FLASHES TESTED [illegible] WILD, THAT THE PREDICTIVE USEFULNESS OF THE SIMULATION DATA WILL BE SUSPECTED TO NORMALLY LOW LEVELS OF EXPOSURE. IF POTENTIAL APPLICATIONS CAN INCLUDE THE POSSIBILITY OF HARMFUL EFFECTS, THEN THE SIMULATION PREDICTIONS WOULD PROBABLY BE VALUABLE WITH REFERENCE TO INDIVIDUALS EXPOSED AT LONG DISTANCE FROM THE SOURCE AND CONSEQUENTLY RECEIVING EXPOSURE INTENSITIES SIMILAR TO THOSE TESTED IN THE STUDY. HOWEVER, IT SHOULD BE CLEARLY UNDERSTOOD, THAT THE SIMULATION PREDICTIONS MIGHT NOT BE ACCURATE FOR HIGH INTENSITY EXPOSURES, REGARDLESS OF WHETHER PERMANENT EYE DAMAGE RESULTS.

2. TASK RELEVANCE

THE PROPOSAL DOES NOT PRESENT THE PERFORMANCE TASKS IN SUFFICIENT DETAIL TO ALLOW EVALUATIONS OF ADEQUACY AND RELEVANCE. OUR EXPERIENCE INDICATES THAT PERFORMANCE TASK DESIGN, MEASUREMENT AND [illegible] EXTRAPOLATIVE POWER IN THE PROPOSED STUDY MAY BE VERY DIFFICULT TO ACHIEVE, WHILE THE SIMULATION TECHNIQUE ITSELF MAY BE RELATIVELY EASY TO ACHIEVE. THE TASKS, MEASUREMENTS METHODS AND FIELD APPLICABILITY SHOULD BE ELABORATED FURTHER SINCE PERFORMANCE ESTIMATES ARE THE PRIMARY OUTPUT OF THE PROPOSED WORK.

3. CONCLUSIONS

IF HUMAN PERFORMANCE DATA ARE OBTAINED UNDER CONDITIONS OF VARIABLE ILLUMINATION CORRESPONDING TO FLASHBLINDNESS RECOVERY FOLLOWING LOW INTENSITY EXPOSURES, THE PROPOSED SIMULATION [illegible]

THE PRIMARY OUTPUT DESIRED.

QUESTIONS EXIST AS TO THE ACCURACY OF THE MODEL UPON WHICH THE PREDICTIONS OF THE SIMULATION TECHNIQUE ARE BASED WHEN EMPLOYING FLASH INTENSITIES WHICH ARE POTENTIALLY DAMAGING. THESE QUESTIONS MIGHT BE BEST APPROACHED IN SUPPLEMENTARY EXPERIMENTS USING ANIMALS.

4. GENERAL REMARKS:

WITH RESPECT TO THE OVERALL QUESTION OF THE EFFICACY OF FLASH BLINDNESS INCAPACITATION, OUR PRELIMINARY THINKING IS THAT THE TECHNIQUE WOULD BE MOST VALUABLE AS AN ADJUNCT TO OTHER TECHNIQUES. THERE MAY BE A NUMBER OF SITUATIONS IN WHICH A FEW SECONDS OF DISORIENTATION, CONFUSION AND IMPAIRED VISION WOULD ALLOW FRIENDLY PERSONNEL TO ACCOMPLISH SOME VITAL OBJECTIVE OR PERMIT THE CAPTURE OR RESTRAINT OF UNFRIENDLY INDIVIDUALS. THE FLASH TECHNIQUE WOULD BE MOST USEFUL AT NIGHT; IT WOULD NOT BE AN INCONSPICUOUS TACTIC.

IN CONSIDERING THE OPERATIONAL EMPLOYMENT OF ANY FLASH BLINDNESS SYSTEM, IT WOULD SEEM IMPERATIVE TO KNOW THE CONSTRAINTS ON THE USE OF THE SYSTEM. THESE CONSTRAINTS WOULD DICTATE WHEN, HOW, TO UNDER WHAT CONDITIONS THE SYSTEM MIGHT BE USED. THEY WOULD AFFECT THE CHOICE OF DELIVERY SYSTEM. IF A GRENADE OR OTHER PROJECTILE-TYPE DELIVERY SYSTEM WERE USED, A SMALL ERROR IN PLACEMENT OF THE PYROTECHNIC DEVICE COULD MEAN A HUNDREDFOLD (OR MORE) DIFFERENCE IN LIGHT INTENSITY AT THE TARGET POINT. THIS IS A STRAIGHTFORWARD EFFECT OF THE INVERSE SQUARE LAW.

SPECIFICALLY, IT SEEMS AS THOUGH THE RETINAL [illegible] AGE THRESHOLD FOR LIGHT FLASHES MUST BE DETERMINED BEFORE FLARES [illegible] BE USED OPERATIONALLY. IT WOULD SEEM, TOO, THAT GROSS OR EV. MICROSCOPIC RETINAL DAMAGE CRITERIA ARE NOT ACCEPTABLE WHERE HUMAN EXPOSURE IS CONTEMPLATED -- ESPECIALLY IF NON-BELLIGERENT INDIVIDUALS ARE INVOLVED. IF SAFE EXPOSURE CRITERIA ARE NOT EVEN AVAILABLE FOR EXPERIMENTAL TESTING OF THE FLARES, THEN IT WOULD APPEAR THAT WE DON'T KNOW ENOUGH TO USE THESE DEVICES OPERATIONALLY -- EVEN IF WE CAN PREDICT THE PERFORMANCE DECREMENT EXPECTED.

5. ALTERNATE SUPPLEMENTARY APPROACHES:

SOPHISTICATED PRIMATE STUDIES COULD PROVIDE INFORMATION AS TO THE FUNCTIONAL DAMAGE THRESHOLD. [illegible] FOR EXAMPLE, IS SUCCESSFULLY USING LANDOLT RINGS OF VARYING

GAP WIDTH TO MEASURE VISUAL ACUITY IN MONKEYS; THERE ARE OTHER TECHNIQUES. EVOKED POTENTIALS ARE A GOOD MEANS OF MEASURING VISUAL THRESHOLD -- A TECHNIQUE BEING USED NOW AT DUK[illegible]

IN ADDITION TO MEASURING DAMAGE THRESHOLD, EXPERIMENTS WITH TRAINED PRIMATES COULD PROVIDE A MEASURE OF PERFORMANCE DECREMENT FOLLOWING EXPOSURE TO THE ACTUAL FLARES THEMSELVES. HUMAN PERFORMANCE UNDER SIMILAR CONDITIONS MIGHT BE EXTRAPOLATED FROM THESE RESULTS. WHILE PERFORMANCE DECREMENT OF FLARES UNDER CONDITIONS OF SIMULATED FLASH BLINDNESS MAY BE IMPORTANT TO KNOW, THERE APPEARS TO BE MUCH MORE INFORMATION GAP RELATED TO THE ACCEPTABLE INTENSITY LEVEL OF REAL FLARES FOR USE UNDER REAL FIELD CONDITIONS. THESE LATTER DATA MIGHT BE OBTAINED FROM CAREFULLY [illegible] STUDIES.