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AD-704 500

CIVIL DEFENSE SYSTEMS: SHELTERS

Volume I of II Volumes

A CDC BIBLIOGRAPHY

February 1960 - August 1969

DDC-TAS-77-36-1

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April 1970

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AD-704 500

CIVIL DEFENSE SYSTEMS:
SHELTERS

VOLUME I OF II VOLUMES

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F O R E W O R D

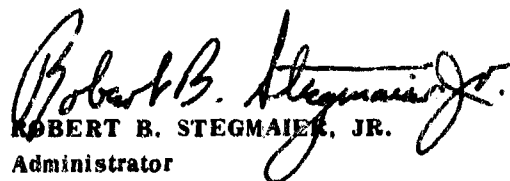
This unclassified and unlimited bibliography is Volume I of a two-volume set on *Civil Defense Systems: Shelters*, in a series of scheduled bibliographies on the Civil Defense Systems. References were selected from the Defense Documentation Center's collection and cover the period January 1960 to December 1969.

Corporate Author-Monitoring Agency, Subject, and Contract indexes are included.

Volume II, AD-868 250, contains 97 references with limited distribution.

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

OFFICIAL


ROBERT B. STEGMAIER, JR.
Administrator

Defense Documentation Center

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ATMOSPHERIC TURBULENCE

CIVIL DEFENSE SYSTEMS: COMMUNICATIONS

COST EFFECTIVENESS

FIRE EXTINGUISHERS

FOREST FIRES AND RELATED EQUIPMENT

HEAD-UP DISPLAY SYSTEMS

MICROFICHE, MICROFILM AND RELATED EQUIPMENT

MICROMINIATURIZATION(ELECTRONICS)

RING WINGS

SEARCHLIGHTS

SOIL MECHANICS

WEATHER CONTROL

WEATHER FORECASTING

WEATHER SATELLITES

WHITE PHOSPHORUS

XENON LAMPS

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-258 246

NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
DOSE ATTENUATION FACTORS FOR CONCRETE SLAB SHIELDS
COVERED WITH FALLOUT AS A FUNCTION OF TIME AFTER
FISSION

(U)

JUN 61 30P DONOVAN, L. K. ICHILTON, A.

B. 1

REPT. NO. NCEL-TR-137

PROJ: Y-FU11-US-327

UNCLASSIFIED REPORT

DESCRIPTORS: *CONCRETE, *DOSE RATE, *RADIOACTIVE
FALLOUT, *SHELTERS, ATTENUATION, CIVIL DEFENSE
SYSTEMS, COUNTERMEASURES, DOSAGE, FISSION, GAMMA RAYS,
NUCLEAR EXPLOSIONS, NUCLEAR WARFARE, RADIOACTIVE
DECAY, RADIOLOGICAL DOSAGE, RADIOLOGICAL WARFARE,
SHIELDING, THICKNESS, TIME, UNDERGROUND STRUCTURES (U)

A STUDY WAS MADE TO INVESTIGATE THE DOSE
ATTENUATION OF FALLOUT GAMMA RADIATION BY VARIOUS
THICKNESSES OF CONCRETE ROOFS OF BURIED FALLOUT
SHELTERS AS A FUNCTION OF TIME AFTER A NUCLEAR
DETONATION. A SPECTRUM OF ENERGIES IS USED FOR THE
FALLOUT SOURCE RATHER THAN A SINGLE AVERAGE ENERGY AS
HAS BEEN DONE IN PREVIOUS STUDIES. DOSE
ATTENUATION FACTORS ARE DERIVED AND PRESENTED AS A
FUNCTION OF THE ABOVE PARAMETERS. THE OFFICE OF
CIVIL AND DEFENSE MOBILIZATION RECOMMENDS A
TWO-WEEK SHELTER-STAY TIME IN THE EVENT OF A NUCLEAR
ATTACK; THEREFORE, ALSO PRESENTED IS AN AVERAGE DOSE
ATTENUATION FACTOR FOR ANY FOURTEEN-DAY STAY TIME AS
A FUNCTION OF TIME OF ARRIVAL OF THE FALLOUT OR OF
SHELTER-ENTRY TIME FOR VARIOUS ROOF THICKNESSES.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-276 119

CALIFORNIA UNIV BERKELEY INST OF ENGINEERING
RESEARCH

SURVEYS OF FALLOUT SHELTER. A COMPARISON BETWEEN
AERIAL PHOTOGRAPHIC AND DOCUMENTARY METHODS

(U)

FEB 60 IV KLEINECKE, D.C.:

REPT. NO. S2 126

CONTRACT: CD SR58 40

UNCLASSIFIED REPORT

DESCRIPTORS: •SHELTERS, •UNDERGROUND STRUCTURES,
AERIAL PHOTOGRAPHY, ANALYSIS, CIVIL DEFENSE SYSTEMS,
EFFECTIVENESS, MAPPING, MAPS, RADIOACTIVE FALLOUT,
SHIELDING

(U)

IN 1959 A LARGE PART OF CONTRA COSTA COUNTY,
CALIFORNIA WAS SURVEYED FOR FALLOUT SHELTER AREAS.
THIS SURVEY WAS BASED ON AN EXAMINATION OF THE TAX
ASSESSOR'S RECORDS OF EXISTING BUILDINGS. A
PORTION OF THIS AREA WAS ALSO SURVEYED INDEPENDENTLY
BY A METHOD BASED ON AERIAL PHOTOGRAPHY. A
STATISTICAL COMPARISON OF THE RESULTS OF THESE TWO
SURVEYS INDICATES THAT THE AERIAL PHOTOGRAPHIC METHOD
WAS MORE EFFICIENT THAN THE DOCUMENTARY METHOD IN
LOCATING POTENTIAL SHELTER SPACE IN BUILDINGS OF
HEAVY CONSTRUCTION. THIS RESULT, HOWEVER, IS
PROBABLY NOT OPERATIONALLY SIGNIFICANT. THERE IS
REASON TO BELIEVE THAT A COMBINATION OF THESE TWO
SURVEY METHODS COULD BE DEvised WHICH WOULD BE
OPERATIONALLY PREFERABLE TO EITHER METHOD.

(AUTHOR)

(U)

UNCLASSIFIED

/BML27

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-276 392

TECHNICAL OPERATIONS INC BURLINGTON MASS
SHELTER FROM FALLOUT

(U)

APR 61

IV

CALLAHAN, E.D.; ROSENBLUM, L.I.

COOMBE, J.R.;

REPT. NO. B 60 30

CONTRACT: CDM SR59 33

UNCLASSIFIED REPORT

DESCRIPTORS: *CIVIL DEFENSE SYSTEMS, *RADIOACTIVE
FALLOUT, *SHELTERS, *UNDERGROUND STRUCTURES, BOATS,
CONSTRUCTION, COSTS, DESIGN, DOSE RATE, LAKES,
MATERIALS, NUCLEAR EXPLOSION DAMAGE, NUCLEAR
EXPLOSIONS, NUCLEAR WARFARE, OCEANS, RADIOLOGICAL
WARFARE, SHIPS

(U)

A SURVEY IS PRESENTED OF THE EXISTING FALLOUT
SHELTER POTENTIAL IN BASEMENTS AND MINES IN THE
UNITED STATES, AND IN BOATS ON BODIES OF WATER OF
SUFFICIENT SIZE AND DEPTH. ALSO PRESENTED IS AN
ANALYSIS OF THE DESIGN, CONSTRUCTION, AND
HABITABILITY OF A MINIMUM-TYPE, IMPROVISED HOME
BASEMENT FAMILY FALLOUT SHELTER, AND THE SHELTER
POTENTIAL IN AN ACTUAL SUBURBAN COMMUNITY IN THE
NORTHEAST. THE SURVEY SHOWS THAT ABOUT 60% OF
THE POPULATION IN THE U. S. WOULD HAVE ACCESS TO
BASEMENT SHELTER, WITH THE FIGURES RANGING FROM
BETTER THAN 80% IN UCDM REGIONS 1, 2, AND 4 TO
LESS THAN 20% IN REGIONS 3, 5, AND 7. MINE
SHELTER COULD BE AN IMPORTANT SHELTER RESOURCE FOR
TWO TO FOUR MILLION PEOPLE IN SOME 16 STATES. A
FAMILY-SIZE, SAND-BAG FALLOUT SHELTER CAN BE READILY
CONSTRUCTED IN THE BASEMENT CORNER BY ONE PERSON FOR
A MATERIALS COST OF ABOUT \$50. THE SHELTER,
WHICH OFFERS A PROTECTION FACTOR OF 100 AGAINST
OUTSIDE RADIATION LEVELS, CAN BE ASSEMBLED IN AN HOUR
IF THE MATERIALS ARE SUITABLY STORED ALONG THE
BASEMENT WALLS, AND REALISTIC EXCURSION SCHEDULES
APPEAR POSSIBLE AFTER TWO DAYS EVEN IN THE HEAVIEST
FALLOUT AREAS. A SURVEY OF PUBLIC AND PRIVATE
BUILDINGS IN A TYPICAL NORTHEASTERN SUBURBAN CITY OF
25,000 POPULATION INDICATED THAT THE BASEMENTS OF
SCHOOLS, CHURCHES, AND OTHER LARGE BUILDINGS DO NOT
OFFER SIGNIFICANTLY BETTER PROTECTION THAN THAT OF
THE AVERAGE HOME BASEMENT (I.E., ABOUT A FACTOR OF
20). (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-286 933

TEXAS UNIV AUSTIN

ATTITUDES AND KNOWLEDGE CONCERNING FALLOUT SHELTERS

IN AUSTIN, TEXAS

(U)

JAN 62

IV

MOORE, HARRY ESTILL;

CONTRACT: CDM SK62 2

UNCLASSIFIED REPORT

DESCRIPTORS: *CIVIL DEFENSE SYSTEMS, *SHELTERS,
ATTITUDES, BEHAVIOR, DISASTERS, GROUP DYNAMICS,
LEADERSHIP, PUBLIC HEALTH, SOCIOMETRICS, STATISTICAL
DATA

(U)

D-286 9337N3 ***AN ANALYSIS OF DATA CONCERNING
PERSONNEL ATTITUDES AND KNOWLEDGE OF FALLOUT SHELTERS
IN THE EVENT OF A NUCLEAR ATTACK.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-288 228

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

THE FAMILY OCCUPANCY TEST, 4-6 NOVEMBER 1960

(U)

AUG 62 IV STROPE, W.E. LETTER, H.S.:

REPT. NO. TR578

UNCLASSIFIED REPORT

DESCRIPTORS: •SHELTERS, •UNDERGROUND STRUCTURES,
CHILDREN, CIVIL DEFENSE SYSTEMS, DIET, NOISE,
RECREATION, WOMEN

(U)

THE USNRDL EXPERIMENTAL SHELTER AT CAMP
PARKS, CALIFORNIA, WAS OCCUPIED FOR A PERIOD OF
48 HOURS BY 99 MEN, WOMEN, AND CHILDREN. AGES OF
THE PARTICIPANTS RANGED FROM ABOUT 3 MONTHS TO 68
YEARS. FAMILY SIZE RANGED FROM SINGLE PERSONS TO A
FAMILY OF SEVEN. ALL ASPECTS OF THE SHELTER
ENVIRONMENT AS WELL AS THE ACTIONS AND RESPONSE OF
THE SHELTEREES WERE MONITORED. CHILDREN OF ALL
AGES APPEARED TO ADAPT WELL TO SHELTER CONDITIONS,
BUT THE IMPORTANCE OF CAREFUL PREPARATION,
ORGANIZATION, AND CONTROL OF ACTIVITIES WAS
DEMONSTRATED. THIS IS A PRELIMINARY REPORT MADE IN
ADVANCE OF COMPLETE ANALYSIS OF THE DATA.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-288 914

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
DESIGN MODIFICATIONS AND 1962 COST ANALYSIS FOR A
STANDARDIZED SERIES OF FALLOUT SHELTERS

(U)

SEP 62 IV PORTEOUS, LEWIS G.
REPT. NO. TR582

UNCLASSIFIED REPORT

DESCRIPTORS: *SHELTERS, BLAST, CIVIL DEFENSE SYSTEMS,
CONSTRUCTION, COSTS, DESIGN, DOSIMETERS, ELECTRIC
POWER PRODUCTION, FILTERS (FLUID), FUEL TANKS,
PERISCOPES, RADIO EQUIPMENT, SANITARY ENGINEERING,
SHIELDING, STANDARDIZATION, STORAGE TANKS,
VENTILATION, WATER SUPPLIES

(U)

MAJOR EMPHASIS IS ON RECENT DESIGN MODIFICATIONS
AND 1962 COST ESTIMATES FOR THE PERSONNEL FALLOUT
SHELTER DESCRIBED IN USNMDL-TR-306, SPECIFICATION
AND COSTS OF A STANDARDIZED SERIES OF
FALLOUT SHELTERS (1959). THE SHELTER IS
DESIGNED TO ACCOMMODATE AT LEAST 100 PERSONS FOR 14
DAYS. THE SHELTER WILL PROVIDE THE SPECIFIED
FALLOUT AND BLAST PROTECTION, THE REQUIRED INTERIOR
ENVIRONMENT, AND THE ESSENTIAL "HOTEL-TYPE"
EQUIPMENT AT MINIMUM COST. THE SHELTER ITEMS ARE
SPECIFIED BY SEVERAL PACKAGES, EACH HAVING ONE OR
MORE DIFFERENT ARRANGEMENTS OF ITEMS, DEPENDING ON
THE DEGREE OF PROTECTION AND COMFORT DESIRED. THE
PROPER SELECTION OF PACKAGES WILL RESULT EITHER IN A
35-PSI OR 10-PSI BLAST AND FALLOUT SHELTER SITED
ABOVE OR BELOW GRADE. THE RADIATION PROTECTION
FACTOR IS AT LEAST 1.00. "MOST AUSTERE" TO
"LEAST AUSTERE" LIVING ACCOMMODATIONS CAN BE
SELECTED. AVERAGE COST DATA FOR THE PACKAGES BY
ITEM ARE TABULATED FOR QUANTITIES UP TO 1000.
RESPECTIVE COSTS (LESS OVERHEAD, PROFIT, ETC.)
FOR 4 COMPLETE SHELTERS ARE ESTIMATED AND PRESENTED
GRAPHICALLY. THE COSTS RANGE FROM \$19,800 FOR
THE LEAST-AUSTERE 35-PSI SHELTER TO \$14,200 FOR THE
MOST-AUSTERE 10-PSI SHELTER. THE DESIGN
MODIFICATIONS ARE BASED ON FINDINGS OF THE USNMDL
SHELTER RESEARCH PROGRAM FOR THE PERIOD, 1959 TO
JUNE 1962. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-290 532

HAND CORP SANTA MONICA CALIF

SOUTHERN CALIFORNIA IN A THERMONUCLEAR WAR

(U)

IV BRODE, HAROLD L.

UNCLASSIFIED REPORT

DESCRIPTORS: *NUCLEAR WARFARE, *SHELTERS, *SURVIVAL,
CIVIL DEFENSE SYSTEMS

(U)

LIKELIHOOD OF NUCLEAR ATTACK IN SOUTHERN CALIFORNIA,
CHANCE OF SURVIVAL, AND POSSIBLE PROTECTIVE
MEASURES ARE DISCUSSED.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-296 826

STANFORD RESEARCH INST MENLO PARK CALIF
DEVELOPMENT OF A SHELTER ALLOCATION AND USE PLAN FOR
BOSTON (U)
IV TOWLE, LELAND H.; GREGORY, JOHN G.

UNCLASSIFIED REPORT

DESCRIPTORS: *CIVIL DEFENSE SYSTEMS, ANALYSIS, COSTS,
DATA, LOGISTICS, MOBILIZATION, RADIOACTIVE FALLOUT,
RADIOLOGICAL DOSAGE, SHELTERS (U)

DEVELOPMENT OF A SHELTER ALLOCATION AND USE PLAN FOR BOSTON.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-400 235

ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR
VA

GROUP SHELTER INVESTIGATION

(U)

OCT 62 IV FLYNN, RICHARD M. I

UNCLASSIFIED REPORT

DESCRIPTORS: *SHELTERS, CIVIL DEFENSE SYSTEMS,
CONCRETE, COSTS, DESIGN, FEASIBILITY STUDIES,
MATERIALS, MATHEMATICAL ANALYSIS, METALS, PLASTICS,
SMALL TOOLS, STRUCTURES

(U)

STUDIES TO ENABLE UNSKILLED PEOPLE WITH ONLY LIGHT EQUIPMENT
TO ERECT LOW-COST GROUP SHELTERS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-403 714

CORNELL UNIV ITHACA N Y

FOOD SERVICE PROCEDURES IN FALLOUT SHELTERS. (U)

APR 63 204P

CONTRACT: OCD 0562 49

UNCLASSIFIED REPORT

DESCRIPTORS: *FOOD DISPENSING, *RADIOACTIVE
FALLOUT, FOOD, TRAINING, PERSONNEL MANAGEMENT,
NUTRITION, CONTROL, PREPARATION, SANITARY
ENGINEERING, WASTE (SANITARY ENGINEERING),
WATER, DISPOSAL, ODORS, TEMPERATURE, LIGHT,
STORAGE, CIVIL DEFENCE SYSTEMS, HUMIDITY,
ENERGY, INSTRUMENTATION, HEATING, ENERGY
CONVERSION, CONTAINERS, MANAGEMENT ENGINEERING,
SHELTERS. (U)

CONTENTS: ORGANIZATION AND MANAGEMENT OF FOOD
SERVICES THE NATURE OF THE PROBLEM POLICIES
OF THE FOOD MANAGER ORGANIZATION OF THE FOOD
SERVICES ORIENTATION AND TRAINING OTHER
PERSONNEL MANAGEMENT PROBLEMS FOODS AND FEEDING
CHARACTERISTICS OF WATER AND FOOD SUPPLIES MENU
PLANNING AND STOCKING SELECTION AND DESIGN OF
EQUIPMENT SELECTION OF ENERGY SOURCES ISSUING
AND INVENTORIES PREPARATION, SERVICE,
DISTRIBUTION AND CONTROL SANITATION AND WASTE
DISPOSAL ENVIRONMENTAL FACTORS TEMPERATURE AND
HUMIDITY ODORS AND ODOR CONTROL LIGHTING
REQUIREMENTS, SOURCES AND SCHEMES SPACE
ARRANGEMENT, ASSIGNMENT AND PREDICTION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-403 828

CORNELL UNIV ITHACA N Y

A GUIDE FOR THE TRAINING OF FOOD MANAGERS OF
LICENSED FALLOUT SHELTERS.

APR 63 61P

CONTRACT: OCD 0564 49

(U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPPL. TO A RESEARCH STUDY -
FOOD SERVICE PROCEDURE IN FALLOUT SHELTERS, AD-
403 714.

DESCRIPTORS: *MANAGEMENT ENGINEERING, *FOOD
DISPENSING, *RADIOACTIVE FALLOUT, *SHELTERS,
*TRAINING, HANDBOOKS, PERSONNEL MANAGEMENT,
WATER, CIVIL DEFENSE SYSTEMS, FOODS.
IDENTIFIERS: FALLOUT SHELTERS.

(U)
(U)

THIS PUBLICATION DEALS WITH THAT PHASE OF THE
ADMINISTRATION OF THE LARGE PUBLIC OR SEMI PUBLIC
RADIOACTIVE FALLOUT SHELTERS WHICH HAS TO DO WITH THE
MANAGEMENT OF THE WATER AND FOOD PROBLEMS. IT IS
DESIGNED TO SERVE AS A GUIDE FOR THOSE RESPONSIBLE
FOR PLANNING, ORGANIZING AND MAINTAINING THE
FACILITIES AND THE VOLUNTARY FORCES THAT WILL BE
NEEDED FOR THE SHELTERS AND THE POST-SHELTER
FUNCTIONS. IT DESCRIBES THE PURPOSES, ACTIVITIES
AND RESPONSIBILITIES OF THE FOOD MANAGER AND SUGGESTS
POLICIES, ORGANIZATIONAL PATTERNS, AND
ADMINISTRATIVE PRACTICES. THE DISCUSSION IS LARGELY
LIMITED TO BASIC PROBLEMS AND PRINCIPLES.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-403 829

CORNELL UNIV ITHACA N Y

A MANUAL FOR THE MANAGEMENT OF FOODS IN LICENSED
FALLOUT SHELTERS,

(U)

APR 63 83P

CONTRACT: OCD OS62 49

UNCLASSIFIED REPORT

DESCRIPTORS: •CIVIL DEFENSE SYSTEMS, •FOOD
DISPENSING, DECONTAMINATION, CLASSIFICATION,
MANAGEMENT ENGINEERING, HEATING, COSTS,
LIGHTING EQUIPMENT, NUTRITION, FOOD, STORAGE,
WASTES (SANITARY ENGINEERING), SANITARY
ENGINEERING, WATER, DISTRIBUTION, ABNORMAL
PSYCHOLOGY, BEHAVIOR, RADIATION INJURIES,
CONFINED ENVIRONMENTS, REACTION (PSYCHOLOGY),
ADAPTATION (PHYSIOLOGY), FEAR, SLEEP,
ADJUST MENT (PSYCHOLOGY).

(U)

MANUAL FOR THE MANAGEMENT OF FOODS IN LICENSED FALLOUT
SHELTERS.

UNCLASSIFIED

DUC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-404 194

GAUTNEY AND JONES COMMUNICATIONS INC WASHINGTON, D C
FALL-ELTER COMMUNICATIONS STUDY. (U)

DEC 62 171P

CONTRACT: OGD 0562 123

UNCLASSIFIED REPORT

DESCRIPTORS: *COMMUNICATION SYSTEMS, *CIVIL
DEFENSE SYSTEMS, SHELTERS, SOCIOMETRICS,
PSYCHOLOGY, PUBLIC OPINION, ADJUSTMENT
(PSYCHOLOGY), UNITED STATES GOVERNMENT,
GEOGRAPHY, NETWORKS. (U)

A STUDY WAS CONDUCTED DURING THE PERIOD MAY
THROUGH DECEMBER, 1962, TO DETERMINE THE INTER AND
INTRA-EMERGENCY SHELTER INFORMATION REQUIREMENTS AND
TO PROPOSE WAYS AND MEANS OF MEETING THEM WHICH COULD
BE EMBODIED IN A PRE-ATTACK SHELTER PLANS.
MONTGOMERY COUNTY, MARYLAND, WAS CHOSEN AS A
REPRESENTATIVE COMMUNITY FOR THE STUDY PROTOTYPE.
THE MAJOR CONSIDERATION FOR THIS STUDY WAS THE
ASSUMPTION OF A RADIOACTIVE FALLOUT EFFECT ONLY,
COMPELLING ALL IN THE COUNTY TO REMAIN IN FALLOUT
SHELTERS FOR A PERIOD OF APPROXIMATELY TWO WEEKS.
THE COMMUNICATION REQUIREMENTS NECESSARY FOR THE
CONTROL, COHESION, AND MAINTENANCE OF A POPULATION
GROUP OF SOME 350,000 FOR THE TWO-WEEK PERIOD FOLLOW-
ING THE THERMONUCLEAR ATTACK WERE IDENTIFIED. THESE
REQUIREMENTS, TALLING TEN CATEGORIES OF
INFORMATION, WERE THEN SUBJECTED TO AN ANALYSIS TO
DETERMINE THE TIME REQUIRED TO TRANSMIT, RECEIVE, AND
RELAY ESSENTIAL MESSAGES OVER A SINGLE LEASED WIRE
TELEPHONIC NETWORK, EMPLOYING THE PRINCIPLE OF A
COMMAND AND CONTROL COMMUNICATION NET. ALSO
PROPOSED WAS A TWO-WAY RADIO BACKUP TO THE PRIMARY
TELEPHONIC SYSTEM. THE TIME ANALYSIS DEMONSTRATED
THAT THE PROPOSED COMMUNICATION SYSTEM WILL BE MORE
THAN ADEQUATE TO FULFILL ALL THE COMMUNICATION
REQUIREMENTS BUT ONE. THE EXCEPTION IS THE
CATEGORY OF INFORMATION RELATING TO THE SEPARATION
OF INDIVIDUAL FAMILY MEMBERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-405 709

PANEKO (GUY B) INC NEW YORK
SHELTER CONFIGURATION FACTORS (ENGINEERING AND COST
ANALYSES). (U)

APR 63 IV

CONTRACT: OCD OS62 108
MONITOR: UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

DESCRIPTORS: *SHELTERS, COSTS, ENGINEERING,
CONFIGURATION, ANALYSIS, SHIELDING, BLAST,
FIRES, CHEMICAL WARFARE AGENTS, BIOLOGICAL
WARFARE AGENTS, RADIOLOGICAL WARFARE AGENTS,
RADIOACTIVE FALLOUT, DESIGN, STRUCTURAL PROP
ERTIES, CONCRETE, STEEL, BEDDING, HEAT TRANS
FER, ELECTRICAL EQUIPMENT, OXYGEN CONSUMPTION,
OXYGEN EQUIPMENT, CARBON DIOXIDE, UNDERGROUND
STRUCTURES, TEMPERATURE, HUMIDITY, PICTURES,
SOILS, TABLES, CIVIL DEFENSE SYSTEMS. (U)

SHELTER SHAPES AND SIZES THAT APPEAR TO OFFER THE
BEST COMPROMISE FOR STANDARDIZING NEW SHELTER DESIGN
ARE DESCRIBED. THE STUDY HAD THE FOLLOWING
GENERAL CONDITIONS AND CRITERIA: (1) BELOW
GROUND, SINGLE-UNIT STRUCTURES WITH A MINIMUM OF
THREE FEET OF EARTH COVER SUCH AS MIGHT BE CON
STRUCTED UNDER PARKS OR PLAYGROUNDS; THIS WILL RESULT
IN RADIATION PROTECTION FACTORS OF 1000 OR MORE; (2)
CONSIDERATION OF BOTH FALLOUT AND BLAST
SHELTERS; FALLOUT SHELTERS TO BE DESIGNED ON A
NOMINAL LIVE-LOAD BASIS AND BLAST SHELTERS TO BE
DESIGNED AT 35 AND 60 PSI OVERPRESSURE; (3) AN
EXTENDED SHELTER OCCUPANCY TIME AND A CLOSURE
CAPABILITY OF UP TO 24 HOURS; (4) PROTECTION
AGAINST THE INDUCTION OF CHEMICAL, BIOLOGICAL AND
RADIOLOGICAL CONTAMINANTS; AND (5) SINGLE-UNIT
CAPACITIES OF 100, 500 AND 1000 PER SONS EACH WITH A
5-MINUTE LOADING CAPABILITY. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-405 930

STANFORD RESEARCH INST MENLO PARK CALIF
LINCOLN SHELTER UTILIZATION STUDY. VOLUME II. A
SHELTER ASSIGNMENT PROCEDURE.

(U)

APR 63 9UP GUALTIERI, ANGELO I

JENSEN, GORDON F. I

CONTRACT: OCU-05-62-135

MONITOR: OAD NM106

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ORIGINAINS COLOR PLATES; ALL DOC
REPRODUCTIONS WILL BE IN BLACK AND WHITE. ORIGINAL MAY
BE SEEN IN DOC HQ.

DESCRIPTORS: *SHELTERS, *POPULATION, *CIVIL
DEFENSE SYSTEMS, MAPPING, DATA PROCESSING
SYSTEMS, STATISTICAL ANALYSIS, COSTS, BEHAVIOR,
RADIOACTIVE FALLOUT, DISTRIBUTION.

(U)

THIS IS VOL. II OF A REPORT ENTITLED LINCOLN
SHELTER UTILIZATION STUDY. VOL. I IS
ENTITLED 'A REVIEW OF THE REQUIREMENTS OF
SHELTER UTILIZATION PLANNING.' THIS SECOND
REPORT DEALS SPECIFICALLY WITH A STEP-BY-STEP
PROCESS OF ASSIGNING THE POPULATION OF LINCOLN,
NEBRASKA TO FALLOUT SHELTERS. THE TECHNIQUES
DEVELOPED THEREIN CAN READILY BE APPLIED TO NUMEROUS
CITIES HAVING CHARACTERISTICS SIMILAR TO THOSE OF
LINCOLN, NEBRASKA. LARGE CENSUS TRACT MAPS CAN
BE DESIGNED AND USED IN ASSIGNING BLOCKS OF PEOPLE TO
SHELTERS. METHODS OF DEVELOPING DAY AND NIGHTTIME
POPULATION DATA FOR ANY GIVEN CITY ARE DESCRIBED.
A TECHNIQUE OF PUTTING THE SHELTER ASSIGNMENT ON
DATA-PROCESSING CARDS FOR INFORMATION RETRIEVAL IS
DISCUSSED. METHODS OF SORTING PUNCHED CARDS INTO
USEFUL SHELTER ASSIGNMENT REPORTS ARE PRESENTED.
CONSIDERABLE ATTENTION IS GIVEN TO DEMONSTRATING
THE NUMBERS OF PEOPLE WHO WOULD BE SHELTERED UNDER
THREE SEPARATE WARNING TIMES. CERTAIN RULES,
BASED ON THE NATURAL BEHAVIOR OF PEOPLE, ARE
DEVELOPED AS AN AID IN THE ASSIGNMENT PROCESS.
ESTIMATES OF COST AND EFFORT EXPENDED ARE PROVIDED
AS A GUIDE TO ANY CIVIL OFFICIAL WHO WOULD DESIRE TO
USE THE TECHNIQUE DESCRIBED THEREIN.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-405 948

STANFORD RESEARCH INST MENLO PARK CALIF
LINCOLN SHELTER UTILIZATION STUDY, VOLUME I. A
REVIEW OF THE REQUIREMENTS FOR SHELTER UTILIZATION
PLANNING, (U)

APR 63 96P JENSEN, GORDON F.;

GUALTIERI, ANGELO; RUNGE, W.A.; GREENBERG, B.;

REPT. NO. OAD RM106 V1

CONTRACT: OCD-OS-62-135

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ORIGINAL CONTAINS COLOR PLATES: ALL
DDC REPRODUCTIONS WILL BE IN BLACK AND WHITE. ORIGINAL
MAY BE SEEN IN DDC HQ.

DESCRIPTORS: *SHELTERS, BUILDINGS, RADIO
COMMUNICATION SYSTEMS, TRANSPORTATION, EDUCA
TION, NATIONAL DEFENSE, RADIO EQUIPMENT, DE
FENSE SYSTEMS, OPERATION, TELEPHONE COMMUNI
CATION SYSTEMS, CIVIL DEFENSE SYSTEMS. (U)

THIS REPORT ASSESSES THE SITUATION WITH REGARD TO
CIVIL DEFENSE IN LINCOLN, NEBRASKA.

LINCOLN IS A TYPICAL MID-WESTERN CITY AND
REPRESENTATIVE OF MANY CITIES IN THE UNITED
STATES. AS A RESULT, THE SUBJECTS TREATED IN
THIS REPORT ARE APPLICABLE TO MANY CITIES. THE
SERIOUS PROBLEM OF INSUFFICIENT EXISTING BUILDINGS
SUITABLE FOR USE AS SHELTERS IS CONSIDERED. A
SOLUTION INVOLVING THE USE OF BUILDINGS WITH LOWER
PROTECTION FACTORS AND A MOBILITY SYSTEM AFTER
ATTACK IS PROPOSED. A RADIO COMMUNICATIONS SYSTEM
SUITABLE TO THE NEEDS OF THE AREA IS PROPOSED AND
DISCUSSED. A METHOD OF ASSIGNING PEOPLE TO
SHELTERS IS DEMONSTRATED. A SERIES OF MAPS IS
DEVELOPED WHICH AID IN MAKING THE SHELTER ASSIGN
MENTS. A SEPARATE AND SUPPLEMENTAL REPORT, VOL
UME II OF THIS STUDY ENTITLED "LINCOLN SHELTER
UTILIZATION STUDY - A SHELTER ASSIGNMENT PROCE
DURE," HAS BEEN ISSUED, AND PROVIDES A SPECIFIC
ASSIGNMENT OF THE PEOPLE OF LINCOLN TO EXISTING
SHELTER AND SHOWS THE NEED FOR ADDITIONAL SHELTER.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-406 442

RAND CORP SANTA MONICA CALIF

RECENT DEVELOPMENTS IN THE SOVIET CIVIL DEFENSE PROGRAM.

(U)

JUN 63 26P GOURE, LEON I
REPT. NO. P2752

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED TO SUBCOMMITTEE NO. 3 OF THE ARMED SERVICES COMMITTEE OF THE HOUSE OF REPRESENTATIVES, WASHINGTON, D. C., JUNE 17, 1963.

DESCRIPTORS: CIVIL DEFENSE SYSTEMS, TRAINING, SHELTERS, MILITARY STRATEGY, FOREIGN POLICY, MILITARY ORGANIZATIONS, WARFARE, ANALYSIS.

(U)

IDENTIFIERS: USSR.

(U)

THE SOVIET CIVIL DEFENSE PROGRAM IS FAR FROM COMPLETE AND SUFFERS FROM A VARIETY OF SHORT COMINGS. APART FROM THE NOTORIOUS INEFFICIENCY OF SOVIET ADMINISTRATION, THERE IS THE RELATIVELY SHORT TIME THAT MANY PERSONS WILL BE ABLE TO REMAIN IN SHELTERS, BECAUSE OF LIMITED FOOD SUPPLIES. GREAT CROWDING AND ABSENCE OF COOLING EQUIPMENT WILL FORCE LARGE NUMBERS OF THEM TO EVACUATE THEIR SHELTERS VIA CONTAMINATED AREAS WHILE THE RADIATION LEVEL MAY STILL BE FAIRLY HIGH. THE SOVIETS RECOGNIZE THAT THE EFFECTIVENESS OF CIVIL DEFENSE, SURVIVING THE ATTACK, AND WINNING THE WAR WILL DEPEND TO A GREAT EXTENT ON THEIR ABILITY TO BLUNT OR WEAKEN THE ENEMY'S ATTACK. THIS IS WHY SOVIET DOCTRINE ALSO EMPHASIZES PRE-EMPTIVE ATTACKS AS WELL AS THE IMPORTANCE OF ANTI-AIRCRAFT AND ANTI-MISSILE D. DESPITE THE PRESENT INADEQUACIES OF SOVIET CIVIL DEFENSE AND THE GROWING DESTRUCTIVENESS OF MODERN WEAPONS, THE SOVIET LEADERSHIP BELIEVES THAT THE PRESERVATION OF THE SOVIET STATE AND SOCIETY IN THE EVENT OF A WAR MERITS CONSIDERABLE EFFORTS AND THE EXPENDITURE OF RELATIVELY SCARCE MONEY AND RESOURCES. IN THE AUTHOR'S OPINION, THE AVAILABLE EVIDENCE LEAVES NO DOUBT THAT THE SOVIET UNION IS ENGAGED IN AN EXTENSIVE CIVIL DEFENSE PROGRAM AND THAT IT BELIEVES IT TO BE WORTH FURTHER EFFORTS AND CONTINGED INVESTMENTS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-408 308

C-E-I-R INC BEVERLY HILLS CALIF

COMMUNITY ATTITUDES AND ACTION ON THE FALLOUT
SHELTER ISSUE. A CASE STUDY OF TWO COMMUNITIES
LIVERMORE, CALIFORNIA AND NORWALK, CONNECTICUT, (U)

63 117P LU, JOHN Y.; REDDER, LEO

G.; WOLFSON, AND ROBERT J.;

CONTRACT: OGD 0562 102

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (TERS, RADIOACTIVE FALLOUT),
(*POPULATION, BEHAVIOR), STATISTICAL ANALYSIS,
REACTION (PSYCHOLOGY), ATTITUDES,
LEADERSHIP, NUCLEAR WARFARE, GROUP DYNAMICS,
DECISION MAKING. (U)

IDENTIFIERS: 1963. (U)

A CASE STUDY OF TWO COMMUNITIES, LIVERMORE,
CALIFORNIA AND NORWALK, CONNECTICUT, WAS CON
DUCTED BECAUSE THEY HAD BEEN INVOLVED IN SUB STANTIAL
PUBLIC DISCUSSION OF COMMUNITY SHELTER PROGRAMS AND
APPEARED TO BE ON THE VERGE OF CON STRUCTING SHELTERS
ON A COMMUNITY-WIDE BASIS. THE PRIMARY PURPOSE OF
THE STUDY WAS TO INVESTI GATE THE ADOPTION-DIFFUSION,
SOCIAL ACTION AND DECISION-MAKING PROCESSES ABOUT
COMMUNITY SHELTER PROGRAMS. UNFORTUNATELY THE
ADOPTION OF A SHELTER PROGRAM NEVER MATERIALIZED IN
EITHER OF THE TWO COMMUNITIES DUE TO EXTERNAL, AS
WELL AS INTERNAL, FORCES, AND WHAT WAS OBSERVED WAS
A FRUSTRATED EFFORT ON THE PART OF SOME COMMUNITY
MEMBERS TO BUILD COMMUNITY SHELTERS. IN BOTH
COMMUNITIES, THOSE WHO ACTIVELY PROMOTED THE SHELTER
PROGRAMS WERE SCIENTISTS AND/OR ENGINEERS AND THEY
WERE RELATIVELY INEXPERIENCED IN COM MUNITY
LEADERSHIP. THERE WAS ALSO A NOTABLE LACK OF
SUPPORT FROM THE KEY COMMUNITY LEADERS WHO ARE
USUALLY ACTIVE IN CONVENTIONAL COMMUNITY AFFAIRS
SUCH AS RED CROSS DRIVES AND HOSPITAL FUND CAM
PAIGNS. THIS PROBABLY CONTRIBUTED SIGNIFICANTLY
TO THE FACT THAT THE ADOPTION OF A SHELTER PRO GRAM
PROVIDED TO BE ABORTIVE IN BOTH COMMUNITIES.
(AUTHOR) (U)

UNCLASSIFIED

DCC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-410 891

AMERICAN INST FOR RESEARCH PITTSBURGH PA
PLANNING AND ORGANIZING SHELTER NON-OPERATIONAL
ACTIVITY PROGRAMS. (U)

JUN 63 67P

SIROKY, FRANK R. I

ENINGER, MAX U. I

CONTRACT: OCD JS62 107

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, NUCLEAR WARFARE),

(*MANAGEMENT ENGINEERING, SHELTERS), CIVIL
DEFENSE SYSTEM, SOCIOLOGY, SOCIAL COMMUNICA
TION, MAINTENANCE, OPERATION, CONFINEMENT,
PROTECTIVE COVERINGS, PSYCHOLOGY, TRAINING,
POPULATION, BIBLIOGRAPHIES. (U)

IDENTIFIERS: SOCIAL ACTIVITIES, RECREATION,
SOCIAL CONTROL, SHELTEREES. (U)

THE STUDY EXPLORED THE NEED FOR A PLANNED PROGRAM
OF IN-SHELTER ACTIVITIES, SUCH AS TRAINING, REC
REATION, PHYSICAL FITNESS, AND SHELTEREE SERVICES, TO
AID IN THE PREVENTION OF DEMORALIZATION AND LOSS OF
SOCIAL CONTROL. THE ANALYSIS OF THE PROBLEM
CONCLUDED THAT SUCH IN-SHELTER ACTIVITIES WOULD
PROBABLY BE HELPFUL AS AN AUXILIARY MEANS OF
PROMOTING SHELTEREE MORALE AND SOCIAL CONTROL IN THE
EVENT OF POST-NUCLEAR ATTACK CONFINEMENT. THE
SPECIFIC POTENTIAL BENEFITS TO BE GAINED FROM SUCH
ACTIVITIES INCLUDE: (1) REDUCTION OF NEGATIVE
EMOTIONAL STRESS, (2) BREAKDOWN OF PERSONAL
BARRIERS, (3) IMPROVED RESPONSIVENESS TO SHELTER
LEADERSHIP, (4) IMPROVED CONTROL OVER SHELTEREE
BEHAVIOR, AND (5) A SENSE OF FASTER PASSAGE OF
TIME. THE FOLLOWING PRINCIPLES SHOULD CHARACTERIZE
PLANNING, ORGANIZING AND DIRECTING ACTIVITY PROGRAMS:
(1) ACTIVITIES SELECTED SHOULD FACILITATE
ACHIEVEMENT OF SHELTER GOALS, (2) ACTIVITIES
SELECTED SHOULD BE COMPATIBLE WITH THE SHELTEREES,
(3) ACTIVITIES SHOULD BE COMPATIBLE WITH SHELTER
CONDITIONS, (4) ACTIVITIES SHOULD REFLECT SHELTER
PRIORITIES AND REQUIREMENTS, (5) ACTIVITIES RE
QUIRE PRE- AND POST-ENTRY TRAINING, (6)
ACTIVITIES SHOULD REQUIRE LITTLE OR NO STOCKING OF
SUPPLIES OTHER THAN GUIDANCE MATERIALS, (7)
ACTIVITY LEADERS REQUIRE SOME PRE-ENTRY TRAINING ON
PLANNING, ORGANIZING, AND DIRECTING ACTIVITY
PROGRAMS, AND (8) ACTIVITIES MUST BE VOLUNTARY,
NOT FORCED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-411 787

RESEARCH TRIANGLE INST DURHAM N C
EMERGENCY HEALTH PROBLEMS STUDY.

(U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 1,

JUL 63. IV HERZOG, W. T. ;

CONTRACT: OCD 0562 250

PROJ: OCD PROJ. 2411A

UNCLASSIFIED REPORT

DESCRIPTORS: •PUBLIC HEALTH ,CASUALTIES ,CIVIL
DEFENSE SYSTEMS ,DISEASES ,EPIDEMIOLOGY ,INFECTIONS
•MILITARY MEDICINE ,NUCLEAR WARFARE ,POPULATION
•RADIOACTIVE FALLOUT ,RESPIRATORY SYSTEM ,SHELTERS
•SURVIVAL

(U)

THE PEACETIME HEALTH STATUS OF THE POPULATION
(BASED ON THE U. S. PUBLIC HEALTH SERVICE
NATIONAL HEALTH SURVEY) AND THE RANGE OF
COMPLICATIONS DUE TO SHELTER LIVING WERE EVALUATED.
ROUGH ESTIMATES SUGGEST THAT MEDICAL CARE AND
PUBLIC HEALTH MEASURES COULD ADD A NUMBER OF
SURVIVORS EQUAL TO 1 - 2 PERCENT OF THE TOTAL
PREATTACK POPULATION DURING A SINGLE TWO-WEEK PERIOD
UNDER IDEAL CONDITIONS. POSTATTACK MEDICAL CARE OF
CASUALTIES WOULD NOT SERIOUSLY COMPETE WITH MEASURES
DIRECTED TOWARD HEALTH MAINTENANCE OF THE GENERAL
POPULATION, EXCEPT FOR CONSUMABLE MEDICAL SUPPLIES.
BECAUSE CASUALTY CARE AND HEALTH MAINTENANCE OF
NON-CASUALTIES ARE CAPABLE OF ADDING COMPARABLE
NUMBERS OF SURVIVORS DURING THE SHELTER PERIOD (A
MAXIMUM OF 2 PERCENT OF THE PREATTACK POPULATION FOR
EITHER TYPE OF EMPHASIS), IT IS CONCLUDED THAT BOTH
APPROACHES SHOULD BE EMPHASIZED. THE AVAILABLE
DATA ON CHRONIC, NON-COMMUNICABLE DISEASES IS
SUFFICIENT TO ALLOW MORE QUANTITATIVE STOCKPILE
PLANNING OF MEDICAL ITEMS FOR THESE CONDITIONS IN
SHELTERS. FURTHER RESEARCH WILL BE NECESSARY
BEFORE THIS IS TRUE FOR COMMUNICABLE DISEASES,
BECAUSE OF THE COMPLEXITY OF DISEASE SPREAD DURING
SHELTER CONFINEMENT. A METHOD FOR OPTIMIZING THE
ALLOCATION OF DRUGS FOR SUPPORT OF NON-COMMUNICABLE
CHRONIC AND ACUTE CONDITIONS TO SHELTERS IN A
STOCKPILING PROGRAM IS SUGGESTED AND ILLUSTRATED BY
AN EXAMPLE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-412 342

AMERICAN HYDROMATH CO NEW YORK

PLANNING GUIDES FOR DUAL-PURPOSE SHELTERS, (U)

JUL 63 148P

SMITH, ROBERT W.; LASKY, AND

MARY ANN ;

REPT. NO. C93 9 63TR

CONTRACT: OCD 0562 104

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, RADIOACTIVE FALLOUT),
CIVIL DEFENSE SYSTEMS, RADIOLOGICAL CONTAMINA
TION, DECONTAMINATION, VENTILATION, AIR,
PURIFICATION, WATER SUPPLIES, FOOD DISPENSING,
LIGHTING EQUIPMENT, SANTARY ENGINEERING,
DISPOSAL. (U)

IDENTIFIERS: 1963. (U)

THIS DOCUMENT PROVIDES GENERAL PLANNING INFORMA
TION RELATIVE TO THE PRINCIPAL FACTORS WHICH MUST BE
CONSIDERED IN THE DEVELOPMENT OF GROUP FALL OUT
SHELTER FACILITIES. IT DISCUSSES A NUMBER OF
POSSIBLE METHODS FOR DEALING WITH EACH FACTOR.
EMPHASIS IS PLACED UPON THE POTENTIAL DUAL-PURPOSE
USE OF FACILITIES USUALLY AVAILABLE WITHIN EXISTING
STRUCTURES. THE INFORMATION WHICH IS PROVIDED IS
DESIGNED TO PERMIT THE SHELTER PLANNER TO SELECT
SPECIFIC METHODS FOR MEETING EACH SHELTER
REQUIREMENT ACCORDING TO THE NEEDS AND OPPORTUNITIES
DICTATED BY HIS PARTICULAR SITUATION. THE
PLANNING AREAS DISCUSSED IN THE REPORT INCLUDE:
RADIOLOGICAL PROTECTION, OTHER WEAPON EFFECTS,
TEMPERATURE AND ATMOSPHERE CONTROL, WATER SUPPLY,
FOOD, LIGHTING, FIRE PROTECTION, MEDICAL,
SANITATION, COMMUNICATIONS, SLEEPING FACILITIES,
WARNING AND SHELTER ENTRY, AND ORGANIZATION AND
MANAGEMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-415 040

STANFORD RESEARCH INST MENLO PARK CALIF
PLANNING FOR SHELTER USE IN SAN DIEGO,

(U)

SOP WITZEL, FREDERICK D. ;
ROSA, NICHOLAS A. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, CIVIL DEFENSE SYSTEMS),
MANAGEMENT ENGINEERING, PERSONNEL MANAGEMENT, MEDICAL
PERSONNEL

(U)

IDENTIFIERS: PLANNING, 1963, SAN DIEGO

(U)

PLANNING FOR CIVIL DEFENSE SHELTERS IN SAN DIEGO.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-415 614

GENERAL MOTORS CORP FLINT MICH AC SPARK PLUG DIV
SHELTER MEDICAL SUPPORT SYSTEM STUDY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

AUG 63 61P HERZOG, W.T.; WELLS, W.L.;

CROMARTIE, W.J.;

REPT. NO. DU107

CONTRACT: OCD OS62 271

PROJ: 1341A

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, MEDICAL SUPPLIES),
(*CIVIL DEFENSE SYSTEMS, SHELTERS), MEDICAL
PERSONNEL, RADIOACTIVE FALLOUT, SURVIVAL,
COMMUNICATION SYSTEMS, TRANSPORTATION,
MATHEMATICAL MODELS. (U)

IDENTIFIERS: MEDICAL SUPPORT SYSTEM, 1963. (U)

PART I STUDIES VARIOUS POLICIES OF ALLOCATING
MEDICAL RESOURCES (MANPOWER AND MATERIAL) IN AN
AREA NETWORK OF PUBLIC FALLOUT SHELTERS DURING A
POST-NUCLEAR EMERGENCY PERIOD OF TWO WEEKS. IT IS
CONCLUDED THAT A POLICY OF ASSIGNING MEDICAL
RESOURCES TO LARGE SHELTERS IS SUPERIOR TO
CONCENTRATING THEM IN HOSPITALS OR TREATMENT CENTERS.
THE NEAR OPTIMAL STRATEGY REQUIRES DISPERSAL OF
PHYSICIANS IN HIGH PF SHELTERS, BECAUSE OF THEIR
POTENTIAL VALUE IN THE POST-SHELTER PERIOD. IN
FALLOUT ONLY ENVIRONMENTS, MEDICAL SUPPORT OF THE
POPULATION WOULD PLACE MINIMAL DEMANDS ON THE
TRANSPORTATION, SHELTER MANAGEMENT, AND WARNING
SYSTEMS. DEMANDS ON THE COMMUNICATIONS SYSTEM ARE
LIKELY TO BE EXCESSIVE. RECOMMENDATIONS OF
ADDITIONAL RESEARCH FOR MEDICAL PLANNING ARE
INCLUDED. PART II INCLUDES BACKGROUND DATA
ESSENTIAL FOR THE MEASURES OF EFFECTIVENESS USED IN
PART I. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-420 442

AMERICAN INST FOR RESEARCH PITTSBURGH PA
GUIDE TO SHELTER ORGANIZATION AND MANAGEMENT, (U)

SEP 63 IV BEND, EMIL ; GRIFFARD, C. DAVID

; SCHANER, ADA J. ; SHIVELY, ALIZA M. ;

HUDAK, VIVIAN M. ;

REPT. NO. AIR C99 9 63TR

CONTRACT: OCD 0562 164

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, MANAGEMENT ENGINEERING),
(*MANAGEMENT ENGINEERING, SHELTERS), PROTECTIVE
COVERINGS, SAFETY, SANITARY ENGINEERING, FOOD, WATER,
MEDICAL SUPPLIES, ELECTRIC POWER PRODUCTION,
SOCIOLOGY, COMMUNICATION SYSTEMS, LOGISTICS, TRAINING,
RECREATION, CIVIL DEFENSE SYSTEMS (U)
IDENTIFIERS: ORGANIZATION, 1963, REPAIR (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-421 043

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
CIVIL DEFENSE UTILIZATION OF SHIPS AND BOATS, (U)
233P VAN HORN, W. M. IFREUND, D.

MONITOR: NRDL

TR659

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ORIGINAL CONTAINS COLOR PLATES. ALL
DDC REPRODUCTIONS WILL BE IN BLACK AND WHITE. ORIGINAL
MAY BE SEEN IN DDC HEADQUARTERS.

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS, SHIPS (NON-
MILITARY)), (RADIOACTIVE FALLOUT, SHELTERS), BOATS,
FEASIBILITY STUDIES, NUCLEAR WARFARE, POWER PLANTS
(ESTABLISHMENTS), THERMAL RADIATION, STATISTICAL DATA,
POPULATION, URBAN AREAS (U)
IDENTIFIERS: WATERFRONTS, 1963 (U)

VARIOUS WAYS IN WHICH SHIPS AND BOATS MIGHT
SUPPLEMENT THE OVERALL CIVIL DEFENSE PROGRAM WERE
INVESTIGATED. BOTH MERCHANT AND RESERVE
(MOHOBALL) FLEET SHIPS WERE CONSIDERED FOR THE
PART THEY MIGHT PLAY IN A LIFESAVING, LIFE-SUSTAINING
CIVIL DEFENSE CAPACITY. DATA FOR TWO PORT CITIES
WERE ANALYZED TO OBTAIN INFORMATION ON POPULATION
DISTRIBUTION AND SHIPPING ACTIVITY. ENGINEERING
FEASIBILITY STUDIES WERE MADE OF THE USE OF SHIPS AS
PERSONNEL SHELTERS AND THE AVAILABILITY OF SHIPS
UTILITIES FOR USE BY SHORE INSTALLATIONS. THE
PROTECTION OFFERED FROM NUCLEAR FALLOUT RADIATION WAS
CALCULATED FOR TWO CLASSES OF SHIPS. IT WAS
CONCLUDED THAT SHIPS AND BOATS COULD PROVIDE
EVACUATION OR FALLOUT-SHELTER FACILITIES, OR BOTH,
BEFORE OR DURING A NUCLEAR ATTACK. FOR THE
POSTATTACK SITUATION, SHIPS COULD SERVE AS
HEADQUARTERS, HOSPITALS, LIVING QUARTERS,
STOREHOUSES, AND PRIME PRODUCERS OF ELECTRICAL POWER
AND POTABLE WATER. IT IS RECOMMENDED THAT FURTHER
STUDIES BE MADE OF SELECTED PORT CITIES TO DETERMINE
HOW SHIPS AND BOATS COULD BEST BE USED TO SUPPLEMENT
PRESENT CIVIL DEFENSE CAPABILITIES OF THESE CITIES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-421 933

OPERATIONS RESEARCH INC SILVER SPRING MD
STUDY OF TACTICAL MOVEMENT CONCEPTS AND PROCEDURES
FOR CIVIL DEFENSE PLANNING. (U)

AUG 63 206P HAMBERG, W. A. ; SALLEE, A. M. ;

WATKINS, R. H. ;

REPT. NO. 21U

CONTRACT: OCD 0562 187

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS, SHELTERS),
MATHEMATICAL MODELS, POPULATION, URBAN AREAS,
ANALYSIS, DISTRIBUTION, REACTION (PSYCHOLOGY), WARNING
SYSTEMS (U)
IDENTIFIERS: MOVEMENT ANALYSIS, 1963 (U)

A STUDY WAS MADE OF THE FACTORS AND DETERMINANTS
THAT AFFECT THE EMERGENCY MOVEMENT TO SHELTERS OF
URBAN POPULATIONS UNDER CONDITIONS OF LITTLE OR NO
WARNING. AN ANALYTICAL MODEL WAS DEVELOPED TO
DETERMINE THE NUMBER OF PEOPLE ARRIVING AT SHELTER AS
A FUNCTION OF TIME. THE EFFICACY OF THIS MODEL WAS
DEMONSTRATED BY THE PROOF-TESTING OF IT ON THREE
SELECTED CITIES. THE METHOD IS GENERAL IN NATURE
AND PERMITS PRACTICAL APPLICATION IN ANALYZING
SHELTERING CAPABILITIES UNDER VARYING CONDITIONS OF
WEATHER, SEASONS, AND DAYS OF THE WEEK. TECHNIQUES
ARE DEVELOPED FOR DETERMINING POSTURES (I.E.,
ACTIVITY AND PLACE) OF THE MAJOR ELEMENTS OF THE
POPULATION, AND BY INTEGRATING THESE POSTURES THE
DISTRIBUTION OF THE POPULATION AT ANY SELECTED MOMENT
IS DETERMINED. AN EXAMPLE OF A HANDA SOLUTION FOR
THE MODEL IS PRESENTED IN DETAIL FOR ONE CITY;
RESULTS ARE SHOWN FOR THREE CITIES. GENERAL
CONCLUSIONS AND RECOMMENDATIONS ARE DELINEATED;
SUGGESTIONS ARE MADE FOR FUTURE APPLICATION AND
EXPLOITATION OF THE METHOD AND TECHNIQUES FOR THE
EVALUATION OF SHELTERING POLICIES AND OPERATING
PLANS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-425 924

ARMY NATICK LABS MASS
LOW-COST SLEEPING FACILITY. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
OCT 62 56P GATES, JOHN W. ;
SCHWANER, ROBERT M. ;
PROJ: CD1310

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, BEDDING), (*BEDDING, COSTS),
CLOTHING, MATERIALS, CIVIL DEFENSE SYSTEMS (U)
IDENTIFIERS: SLEEPING FACILITY, 1962, COLOR CODING
SYSTEM (U)

DURING THIS STUDY, TWO PROTOTYPE BUNKING FACILITIES WERE DEVELOPED WITH INCORPORATE LOW COST AND MAXIMUM SPACE UTILIZATION. BOTH UNITS UTILIZE A METAL FRAMEWORK WITH A PLYWOOD SLEEPING SURFACE AND ARE CAPABLE OF BEING TIERED 3, 4 AND 5 HIGH FOR HIGH DENSITY SLEEPING. THE UNITS ARE ALSO CAPABLE OF BEING ASSEMBLED AND DISASSEMBLED WITH A MINIMUM OF EFFORT AND TIME AND CAN BE CONVERTED INTO SITTING AND MESSING FACILITIES. THE RECOMMENDED BUNK SIZE IS 75 IN. LONG BY 24 IN. WIDE WITH 20 IN. VERTICAL SPACING. THE COST ESTIMATE PER PERSON IN QUANTITY PURCHASES IS ESTIMATED AT \$3.00 OR LESS. ANY FURTHER INVESTIGATIONS IN HIS AREA SHOULD INCLUDE MORE EXTENSIVE STUDIES ON THE SLEEPING SURFACE MATERIAL, DEVELOPMENT WORK ON THE REFINEMENT OF THE PROTOTYPES, DEVELOPMENT OF A COLOR CODING SYSTEM TO FACILITATE EASE OF ASSEMBLY, A DETAILED INSTRUCTION BOOKLET FOR ASSEMBLING THE UNITS AND A SPECIFICATION FOR PURCHASE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-427 995

RESEARCH TRIANGLE INST DURHAM N C
IMPROVEMENT OF PROTECTION DATA BASE FOR DAMAGE
ASSESSMENT AND DATA BASE ON SHELTER NEEDS: VOLUME

II

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

JAN 64 IV MCMULLAN, PHILIP :

NEBLETT, JOHN ; HILL, EDWARD ; SWEENEY, MALE :

MCGILL, PHILIP :

CONTRACT: OCD 0562 144

PROJ: OUB2 83

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•) RADIOACTIVE FALLOUT, SHELTERS; CIVIL
DEFENSE SYSTEMS, POPULATION, EXPOSURE, ELECTRIC POWER
PRODUCTION, MATHEMATICAL MODELS, VULNERABILITY,
DAMAGE, ANALYSIS, BUILDINGS, POWER PLANTS
(ESTABLISHMENTS), DISTRIBUTION, COMPUTERS, MAGNETIC
TAPE, MAGNETIC CORES

(U)

IDENTIFIERS: BASEMENTS, 1964, DATA FLOW

(U)

THIS REPORT CONTAINS FIVE STUDIES CONCERNED WITH
OBTAINING, COMPILING, OR ANALYZING FALLOUT SHELTER
PROTECTION DATA. THESE STUDIES COVER THE
FOLLOWING SUBJECTS: (1) A REVIEW OF THE
RESIDENTIAL BASEMENT DATA WHICH WERE OBTAINED FROM
THE 1960 U. S. CENSUS OF HOUSING; (2) AN
EXAMINATION OF ELECTRIC POWER AVAILABILITY IN THE
POSTATTACK PERIOD, WITH EMPHASIS UPON FALLOUT
PROTECTION IN POWER PLANTS; (3) THE PREPARATION
OF A PROCEDURE FOR EXTRACTING SUMMARY DISTRIBUTIONS
OF OVERPRESSURE, REFERENCE INTENSITY, AND FALLOUT
ARRIVAL TIME AND RELATING THESE TO NUMBERS OF PEOPLE
EXPOSED; THESE DATA ARE TO BE EXTRACTED FROM THE
ATTACK ENVIRONMENT III OUTPUT TAPES OF THE
JUNBO III DAMAGE ASSESSMENT SYSTEM; (4) THE
RE-EVALUATION, WITH NATIONAL FALLOUT SHELTER
SURVEY DATA, OF AN ANALYTICAL MODEL FOR PREDICTING
FALLOUT PROTECTION FOR PEOPLE AS A FUNCTION OF THEIR
DISTANCE FROM THE CENTER OF A CITY; AND (5) A
STATISTICAL ANALYSIS OF NFSS DATA FROM HOUSTON,
TEXAS; AND DURHAM, NORTH CAROLINA, PERFORMED
TO DETERMINE DISTRIBUTION FUNCTIONS EXPRESSING THEIR
SHELTER CHARACTERISTICS. THESE ANALYTICAL
REPRESENTATIONS OF NFSS DATA ARE APPLIED, IN AN
ILLUSTRATIVE EXAMPLE, TO OPTIMAL ALLOCATION OF
IMPROVEMENT DOLLARS TO VENTILATING BELOW GROUND
SHELTERS TO INCREASE THEIR CAPACITY. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-428 008

RESEARCH TRIANGLE INST DURHAM N C

IMPROVEMENT OF PROTECTION DATA BASE FOR DAMAGE
ASSESSMENT AND DATA BASE ON SHELTER NEEDS. VOLUME

I.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

JAN 64 IV McMULLAN, PHILIP ;

NEBLETT, JOHN ; BATTLE, JOSEPH ; CAMPBELL, HERBERT ;

LUDGIN, QUENTIN ;

REPT. NO. R 0082 83

CONTRACT: OCD 0562 144

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, CIVIL DEFENSE SYSTEMS), DATA PROCESSING
SYSTEMS, DAMAGE, ANALYSIS, CASUALTIES, COSTS,
POPULATION, POWER PLANTS (ESTABLISHMENTS),
MATHEMATICAL MODELS, NUCLEAR WARFARE, COMPUTERS (U)

IDENTIFIERS: DAMAGE ASSESSMENT, REALLOCATION,
1964 (U)

IMPROVEMENT OF PROTECTION DATA BASE FOR DAMAGE ASSESSMENT
AND DATA BASE ON SHELTER NEEDS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-431 063

ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD
ATTENUATION OF FALLOUT RADIATION AS A FUNCTION OF
CONCRETE BLOCKHOUSE WALL THICKNESS. (U)

OCT 63 103P SCHMOKE, MURRAY A. ;

REXROAD, RALPH E. ;

MONITOR: NDL TR43

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, RADIOACTIVE FALLOUT), THICKNESS, CONCRETE,
CONSTRUCTION, CIVIL DEFENSE SYSTEMS, MODELS
(SIMULATIONS), SHIELDING, RADIATION MONITORS, DOSE
RATE (U)

IDENTIFIERS: 1963 (U)

THIS EXPERIMENT WAS CONDUCTED TO VERIFY THEORETICAL
CALCULATIONS OF WALL THICKNESS EFFECT ON THE
SHIELDING CHARACTERISTICS OF A CONCRETE BLOCKHOUSE IN
A UNIFORMLY CONTAMINATED FALLOUT FIELD. TWO GAMMA
EMITTERS, COBALT 60 AND CESIUM 137, WERE USED TO
SIMULATE UNIFORM PLANES OF CONTAMINATION. THE DOSE
RATES AT VARIOUS LOCATIONS WITHIN BLOCKHOUSES WITH
WALL THICKNESS OF 48 PSF, 93.7 PSF, AND 139 PSF WERE
MEASURED WITH IONIZATION-CHAMBER DOSIMETERS.
REDUCTION FACTORS WERE CALCULATED FROM THE DATA
TAKEN AT THE CENTER DETECTOR POSITIONS AND COMPARED
WITH REDUCTION FACTORS COMPUTED FROM THE THEORETICAL
CALCULATIONS OF NATIONAL BUREAU OF STANDARDS.
EXPERIMENTAL AND THEORETICAL REDUCTION FACTORS 3
FEET AND 6 FEET ABOVE THE CENTER OF THE CONCRETE
BLOCKHOUSE AGREED WITHIN *15% FOR A UNIFORMLY
CONTAMINATED PLANE OF COBALT 60, AND WITH *20%
FOR CESIUM 137. COBALT 60 AND CESIUM 137 RADIATION
SHOW APPROXIMATELY EXPONENTIAL ATTENUATION OF DOSE
RATE AS A FUNCTION OF WALL THICKNESS RANGING FROM 48
TO 139 PSF FOR DETECTOR HEIGHTS OF 0 (GROUND
LEVEL), 3, AND 6 FEET. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-431 273

OPERATIONS RESEARCH INC SILVER SPRING MD
EVALUATION OF CIVIL DEFENSE SYSTEMS. SHELTER
UTILIZATION POLICIES IN MONTGOMERY COUNTY,
MARYLAND.

(U)

JAN 64 95P PARENT, S. R.; ILIPPS, R. D. ;
REPT. NO. 236
CONTRACT: OCD DS62 187

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, ANALYSIS),
(*SHELTERS, OPERATION), POPULATION, DESIGN,
CONSTRUCTION, PROTECTIVE COVERINGS, FEASIBILITY
STUDIES

(U)

IDENTIFIERS: OVER CROWDING

(U)

ALTHOUGH THE EVALUATIONS ARE MADE ON THE POLICIES
APPLYING SPECIFICALLY TO MONTGOMERY COUNTY, SOME
GENERAL CONCLUSIONS MAY BE MADE REGARDING THE
APPLICATION OF THE POLICIES AND THEIR PROBABLE
EFFECTS IN ANY AREA. AN OVERRIDING INTERACTION,
WHICH IS EVIDENT AT THIS POINT, IS THAT GENERALLY THE
ACQUISITION OF ADDITIONAL SUITABLE SHELTER SPACE
INCREASES THE ADVANTAGES OF ASSIGNMENT PLANNING AND
DECREASES THE ADVANTAGES OF OVERCROWDING. TABLE 3
PRESENTS THESE GENERAL CONCLUSIONS IN THE FORM OF A
BINARY GOOD OR BAD. ALSO PRESENTED WITH THE
CONCLUSIONS ARE SEVERAL BRIEF STATEMENTS REGARDING
THE DECISIONS AND CONSIDERATIONS AS THEY ARE NOW
UNDERSTOOD. IN SOME CASES, GENERAL KNOWLEDGE IS
NOT SUFFICIENT TO SUPPORT A CONCLUSION; THIS IS TO BE
EXPECTED IN INITIAL STUDIES OF THIS NATURE.
HOWEVER, IT IS FELT THAT THESE CONCLUSIONS SERVE A
HEURISTIC PURPOSE AND MAY BE A FOUNDATION FOR MORE
UNIVERSAL POLICY EVALUATION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-431 930

WESTERN REGIONAL RESEARCH LAB ALBANY CALIF
BULGUR WAFER AND ADJUNCTS FOR FALLOUT SHELTER
RATIONS.

(U)

DESCRIPTIVE NOTE: REPT. FOR JUL 62-JUN 63,
DEC 63 79P SHEPHERD, ALLAN D. ;
BEAVERS, DARRELL V. ; FERREL, ROBERT E. ;
HORVAT, ROBERT J. ; ING, HAWKINS ;
CONTRACT: OCD 0562 54

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, FOOD), (*FOOD, CIVIL DEFENSE SYSTEMS),
WHEAT, DEHYDRATED FOODS, COSTS, STORAGE, STABILITY,
DEGRADATION, ENVIRONMENTAL TESTS, ODORS, CHEMICAL
ANALYSIS, CHROMATOGRAPHIC ANALYSIS, TASTE, PACKING
MATERIALS, VAPORS

(U)

IDENTIFIERS: 1963, WAFERS

(U)

BULGUR WAFER AND ADJUNCTS FOR FALLOUT SHELTER RATIONS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-431 995

RESEARCH TRIANGLE INST DURHAM N C

1115A - ANALYSIS OF SURVEY DATA. (U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT.,

FEB 64 13P HILL, E. L. ; GOGAN, W. K.

LYDAY, R. O. ; NORMENT, M. G. ;

REPT. NO. OUB1

CONTRACT: OCD 0562 144

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*EXPERIMENTAL DATA, RELIABILITY), ANALYSIS, ERRORS,
PROGRAMMING (COMPUTERS), URBAN AREAS, CIVIL DEFENSE
SYSTEMS, OPERATIONS RESEARCH (U)

IDENTIFIERS: 1964 (U)

A REVIEW IS PRESENTED OF THE NATIONAL FALLOUT
SHELTER SURVEY FINDINGS TO ESTIMATE PROBABLE
ERROR, OR RELIABILITY IN THE LIGHT OF EXISTING
EXPERIMENTAL DATA AND THEORETICAL CONSIDERATIONS.
IN CONSULTATION WITH THE SUBCOMMITTEE ON
SHIELDING OF THE ADVISORY COMMITTEE ON CIVIL
DEFENSE, CATEGORIZE THE SURVEYED STRUCTURES WITH
RESPECT TO TECHNICAL SHIELDING CHARACTERISTICS, AND
EVALUATE THE FEASIBILITY AND IMPORTANCE OF DEVELOPING
SPECIAL COMPUTATIONAL PROGRAMS FOR THE SEVERAL
CATEGORIES DETERMINED. EVALUATE NEW INFORMATION ON
SHIELDING FOR APPLICATION TO THE COMPUTATION OF
PROTECTION FACTORS FOR SURVEYED STRUCTURES.
ACCOMPLISH REPROGRAMMING OR ADDITIONAL PROGRAMMING
OF COMPUTATIONAL PROCEDURES FOR ANALYSIS OF THE
SURVEY DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-432 335

HAND CORP SANTA MONICA CALIF

A CASE FOR SURVIVAL DEEP UNDERGROUND.

(U)

MAR 61

IV

BRODE, H. L. ; O'SULLIVAN, J. J.

REPT. NO. P2243

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: IN COOPERATION WITH MITRE CORP.,
BEDFORD, MASS.

DESCRIPTORS: (*UNDERGROUND STRUCTURES, SHELTERS),
(*ENVIRONMENTAL TESTS, UNDERGROUND STRUCTURES), CIVIL
DEFENSE SYSTEMS, SURVIVAL, SHOCK RESISTANCE, DESIGN,
CONSTRUCTION

(U)

IDENTIFIERS: 1961

(U)

A CASE FOR SURVIVAL DEEP UNDERGROUND IS PRESENTED.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-439 251

GEORGIA UNIV ATHENS PSYCHOLOGICAL LABS
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA, 1962-1963.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

169P

HAMMES, JOHN A. OSBORNE, R.

TRAVIS :

CONTRACT: OCD OS 42 224

TASK: 1521A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, CIVIL DEFENSE SYSTEMS),
RADIOACTIVE FALLOUT, SURVIVAL, MODELS (SIMULATIONS),
INSTRUMENTATION, DESIGN, TEST METHODS, CONTROLLED
ATMOSPHERES, TEMPERATURE, HUMIDITY, FOOD, WATER
SUPPLIES, BEHAVIOR, NUTRITION, BLOOD ANALYSIS,
ADJUSTMENT (PSYCHOLOGY), EXCRETION

(U)

A DETAILED REPORT IS PRESENTED OF A SERIES OF TESTS
ON THE HABITABILITY OF FALLOUT SHELTERS AS PRESENTLY
STOCKED IN ACCORDANCE WITH THE NATIONAL SHELTER
PROGRAM. THESE STUDIES SURPASSED IN AUSTERITY
ALL PREVIOUS SHELTER RESEARCH USING CIVILIANS.
MEN, WOMEN, AND CHILDREN, AGE 7-70 YEARS,
PARTICIPATED IN TWO-WEEK CONFINEMENT TESTS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-439 332

TECHNICAL OPERATIONS INC BURLINGTON MASS
PROTECTION FACTORS OF EMERGENCY SHELTERS IN A BRITISH
RESIDENCE, (U)

NOV 63 75P VELLETRI, JOSEPH D. ;
YORK, NANCY-RUTH IBATTER, JOHN F. ;

REPT. NO. B63 41

CONTRACT: OCD 0562 14

TASK: 1111A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*CIVIL DEFENSE SYSTEMS, RADIOACTIVE FALLOUT),
MODELS(SIMULATION), CONSTRUCTION, EFFECTIVENESS,
INSTRUMENTATION, RADIATION MONITORS, RADIOLOGICAL
CONTAMINATION, BUILDINGS, DOSE RATE, EXPERIMENTAL
DATA, GREAT BRITAIN, TEST METHODS (U)

THE CHECK (1) THE VALIDITY OF THE FALLOUT
PROTECTION FACTOR CALCULATIONS FOR RESIDENTIAL
STRUCTURES GIVEN IN BRITISH HOME OFFICE AND
U.S. OCD ENGINEERING MANUALS AND (2) THE
VALIDITY OF RADIATION SCALE MODELING. THE UNITED
STATES AND THE UNITED KINGDOM IN A JOINT EFFORT
TESTED ONE FULL-SCALE TYPICAL RESIDENCE (100 PSF
EXTERIOR WALLS) AND TWO MODELS THEREOF (50 AND
100 PSF EXTERIOR WALLS). EACH HOUSE WAS TESTED
EMPTY AND WITH VARIOUS SHELTER CONFIGURATIONS
INSTALLED. FALLOUT CONTAMINATION WAS SIMULATED BY
PUMPING A MULTICURIE ENCAPSULATED COBALT-60 SOURCE
THROUGH PLASTIC TUBING SURROUNDING THE HOUSES. THE
UNITED STATES CALCULATIONS AGREE WITH MEASURED
DOSE RATES IN THE 50-PSF WALL HOUSE, WHILE BRITISH
CALCULATIONS ARE SLIGHTLY LOWER. AGREEMENT BETWEEN
DOSE RATES MEASURED IN THE 100-PSF WALL FULL-SCALE
AND MODEL HOUSES WAS GOOD AT LOCATIONS AWAY FROM
APERTURES. FULL-SCALE AND MODEL EXPERIMENTAL
RESULTS ARE GENERALLY CONSISTENT WITH BOTH BRITISH
AND U.S. CALCULATIONS, WHICH SHOW A RECTANGULAR
SHELTER TO OFFER MAXIMUM PROTECTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-439 396

GEORGIA UNIV ATHENS PSYCHOLOGICAL LABS
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA, 1962-1963.

DESCRIPTIVE NOTE: FINAL SUMMARY REPT. (U)
DEC 63 12P HAMMES, JOHN A. I
CONTRACT: OCD OS62 226
TASK: 1521A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, CIVIL DEFENSE SYSTEMS),
TESTS, RADIOACTIVE FALLOUT, SURVIVAL, TESTS, HUMAN
ENGINEERING, CONSTRUCTION, FOOD, WATER SUPPLIES,
SANITARY ENGINEERING, BEHAVIOR, MANAGEMENT PLANNING,
ADJUSTMENT (PSYCHOLOGY) (U)

DURING 1962 AND 1963 THE UNIVERSITY OF GEORGIA
PSYCHOLOGICAL LABORATORIES CONDUCTED A SERIES OF
TESTS ON THE HABITABILITY OF FALLOUT SHELTERS AS
PRESENTLY STOCKED IN ACCORDANCE WITH THE NATIONAL
SHELTER PROGRAM. THESE STUDIES SURPASSED IN
AUSTERITY ALL PREVIOUS SHELTER RESEARCH USING
CIVILIANS, MEN, WOMEN, AND CHILDREN, AGE 7 - 70
YEARS, PARTICIPATED IN TWO-WEEK CONFINEMENT TESTS.
(AUTHOR) (U)

UNCLASSIFIED

/BML27

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-439 633

TECHNICAL OPERATIONS INC WASHINGTON D C
PROTECTION FACTORS OF EMERGENCY SHELTERS IN A BRITISH
RESIDENCE. (U)

DESCRIPTIVE NOTE: SUMMARY RESEARCH REPT.
FEB 64 4P BARRETT, M. J. :

CONTRACT: OCD 0562 14

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, GREAT BRITAIN), (*PROTECTIVE
COVERINGS, SHELTERS), (*CIVIL DEFENSE SYSTEM,
OPERATION), DESIGN, POPULATION, THEORY, STRUCTURES,
RADIATION EFFECTS, STEEL, RADIOACTIVE FALLOUT,
INSTRUMENTATION, TABLES (U)
IDENTIFIERS: EMERGENCY SHELTERS, FALLOUT
PROTECTION (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-446 445

BATTELLE MEMORIAL INST COLUMBUS OHIO
METHODS FOR DISPOSING OF EXCESS SHELTER HEAT, (U)
AUG 64 OBP HUMMELL, JOHN D. ;
BEARINT, DAVID E. ; FLANIGAN, LAWRENCE J. ;
CONTRACT: OCD OS62 191

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, COOLING), (*COOLING *
VENTILATING EQUIPMENT, SHELTERS), CIVIL DEFENSE
SYSTEMS, AIR COOLED, LIQUID COOLED, HEAT EXCHANGERS,
HEAT SINKS, REFRIGERATION SYSTEMS, DESIGN, COSTS,
HUMIDITY, VAPORS, ABSORPTION, COMPRESSION, RADIATION
DAMAGE, MATERIALS, FUELS, MAINTENANCE, AIR
CONDITIONING EQUIPMENT, ICE, FEASIBILITY STUDIES (U)

TECHNICAL AND ECONOMIC DATA WERE DEVELOPED IN THREE
CATEGORIES: HEAT SINKS, MISCELLANEOUS COOLING-SYSTEM
COMPONENTS, AND REFRIGERATION AND DEHUMIDIFICATION
DEVICES. VARIOUS COMBINATIONS WERE CONSIDERED AS
ASSEMBLED INTO COOLING SYSTEMS AND THESE SYSTEMS WERE
THEN EVALUATED WITH RESPECT TO THEIR COST
EFFECTIVENESS IN REMOVING EXCESS SHELTER HEAT.
SPECIAL ATTENTION WAS GIVEN TO THE CONCEPTION OF
APPLICABLE NEW COOLING SYSTEMS. A COMPARISON IS
ALSO MADE OF THE ADVANTAGES, DISADVANTAGES, AND
ESTIMATED COSTS ASSOCIATED WITH VARIOUS CONVENTIONAL
AND NOVEL SYSTEMS. AREAS OF NEEDED RESEARCH ARE
DEFINED FOR THE DEVELOPMENT OF NOVEL SYSTEMS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-450 224

NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
HEAT DISSIPATION FROM ABOVE GROUND SHELTERS, (U)
SEP 64 53P STEPHENSON, J. M. I

REPT. NO. NCEL-TN-634

PROJ: Y FOII US 02 341

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, COOLING + VENTILATING
EQUIPMENT), RADIOACTIVE FALLOUT, DESIGN, CONSTRUCTION,
HEAT TRANSFER, STRUCTURES, THERMAL CONDUCTIVITY,
ANALYSIS, SYSTEMS ENGINEERING, CIVIL DEFENSE SYSTEMS (U)

ABOVE GROUND STRUCTURES WHICH HAVE BEEN OFFICIALLY
DESIGNATED AS FALLOUT SHELTERS POSE A NUMBER OF
VENTILATION PROBLEMS WHICH REQUIRE ATTENTION TO
INSURE THAT THE THERMAL ENVIRONMENT OF THE PROTECTED
AREA WILL BE HABITABLE. THE VARIOUS MATERIALS AND
CONFIGURATIONS OF THE STRUCTURES AND THE EFFECT OF
SOLAR RADIATION REQUIRES THAT THE HEAT TRANSFER
THROUGH WALLS AND OTHER SURFACES BE CONSIDERED
SEPARATELY. TO PROVIDE HEAT TRANSFER DATA FOR
THOSE STRUCTURES WHICH ARE OF THICK WALL
CONSTRUCTION, A WIDELY ACCEPTED ANALYTICAL SOLUTION
WAS PROGRAMMED FOR THE 1620 COMPUTER. A MODIFIED
PSYCHROMETRIC CHART WAS DEVELOPED SO THE SENSIBLE
HEAT FACTOR TECHNIQUE CAN BE USED TO DETERMINE
VENTILATION REQUIREMENTS FOR ABOVE GROUND SHELTERS
SUBJECTED TO UNUSUAL CLIMATIC CONDITIONS. SAMPLE
CALCULATIONS FOR A 500MAN SHELTER LOCATED IN ST.
LOUIS, MISSOURI SHOW THAT THE MAXIMUM HEAT GAIN
THROUGH THE THICK WALLS IS ONLY 1.79% OF THE HUMAN
LOAD AND THE HEAT LOSS THROUGH THE FLOOR IS 3.33%
OF THE HUMAN LOAD. THE PEOPLE IN THIS CASE
CONTRIBUTE ALMOST THE ENTIRE NET HEAT LOAD.
CONTINUED WORK ON THIS TASK IS DIRECTED TOWARD THE
ACCUMULATION OF MORE DATA ON HEAT TRANSFER THROUGH
WALLS OF HEAVY CONSTRUCTION, AND HEAT LOSS THROUGH
THE FLOOR. FURTHER MODIFICATIONS TO THE
PSYCHROMETRIC CHART MAY BE NEEDED AND THE INSIDE
DESIGN CONDITIONS ARE TO BE INVESTIGATED WITH
RESPECT TO COMFORT VS. ECONOMY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-450 737

DIRECTOR OF ENGINEERING AND INDUSTRIAL SERVICES L. EWOOD
ARSENAL MD

COST ESTIMATES FOR PROVIDING BIOLOGICAL AGENT
PROTECTION TO FALLOUT SHELTERS,

OCT 64 57P PEITY, JOHN B. ,1111

(U)

BROOKS, WILLIAM L. ;
REPT. NO. 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*BIOLOGICAL WARFARE, SHELTERS),
(*SHELTERS, COSTS), (*CIVIL DEFENSE SYSTEMS,
BIOLOGICAL WARFARE), DECONTAMINATION, COOLING &
VENTILATION EQUIPMENT, AIR INTAKE FILTERS, BUILDINGS,
UNDERGROUND STRUCTURES, CONTROLLED ATMOSPHERES,
PRESSURE, CONSTRUCTION, FEASIBILITY STUDIES (U)

THIS REPORT DISCUSSES A COST ESTIMATE FOR PROVIDING
BIOLOGICAL AGENT PROTECTION IN 50 MILLION EXISTING
FALLOUT SHELTERS AND FOR 100 MILLION SPACES PLANNED
FOR FUTURE CONSTRUCTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-454 314

IIT RESEARCH INST CHICAGO ILL

STRUCTURAL COST STUDIES FOR HARDENED SHELTERS (500-
MAN AND 1000-MAN CAPACITIES). (U)

DESCRIPTIVE NOTE: FINAL REPT.,

JAN 65 IV HAVERS, JOHN A. ;

LUKES, JERRY J. ;

PROJ: M6064 1

TASK: 1152E

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON TOTAL SHELTER DESIGN
OPTIMIZATION.

DESCRIPTORS: (SHELTERS, COSTS), UNDERGROUND
STRUCTURES, CIVILIAN DEFENSE SYSTEMS, STRUCTURAL
PROPERTIES, DESIGN, CONFIGURATION, OPTIMIZATION,
DETERMINATION, CONSTRUCTION, MATERIALS, STEEL,
CONCRETE, WOOD, REINFORCED CONCRETE, HARDENING (U)

APPLYING THE COST AND DESIGN RELATIONSHIPS
DEVELOPED IN AN EARLIER STUDY, THE IN-PLACE
STRUCTURAL COSTS OF 500-MAN TO 1000-MAN CAPACITY
FULLY-BURIED SHELTERS WERE IDENTIFIED AS FUNCTIONS OF
STRUCTURAL MATERIAL, STRUCTURAL SYSTEM, SHELTER
CONFIGURATION, AND DESIGN LEVEL OF LOADING. BY
COMBINING THE OPTIMA OF THESE DESIGNS, MINIMUM-
STRUCTURAL-COST RELATIONSHIPS WERE DEVELOPED FOR 100-
MAN, 500-MAN AND 1000-MAN CAPACITY SHELTERS AS
FUNCTIONS OF OVERPRESSURE LEVEL. THE RANGE OF
INTEREST, AS IN THE EARLIER STUDY, INCLUDED 10 PSI TO
200 PSI OVERPRESSURES PRODUCED BY NUCLEAR YIELDS OF
ONE MT TO 100 MT. ONCE DESIGN OVERPRESSURES
HAVE INCREASED TO SOME UNSPECIFIED LEVEL, THE
ABSOLUTE MAGNITUDE OF WHICH DECREASES AS SHELTER
DESIGN CAPACITY IS INCREASED, IT IS FOUND THAT PER
OCCUPANT STRUCTURAL COSTS ARE RELATIVELY INSENSITIVE
TO INCREASING APPRECIABLY, ALTHOUGH AT A DECREASING
RATE, AS SHELTER DESIGN CAPACITY IS INCREASED.
FINALLY, THE ECONOMIC IMPORTANCE OF IDENTIFYING THE
MINIMUMCOST STRUCTURAL DESIGN FOR EACH PROPOSED
SHELTER APPLICATION IS EMPHASIZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-461 856

MRD DIV GENERAL AMERICAN TRANSPORTATION CORP NILES

ILL

ANALYSIS OF ABOVEGROUND FALLOUT SHELTER VENTILATION
REQUIREMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT., JUN 63-AUG 64.

DEC 64 IV BASCHIERE, R. J. ;

LOKMANHEKIM, H. ; MOY, H. C. ;

REPT. NO. MRD-1240-1

CONTRACT: OCD 0563 176

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SHELTERS, VENTILATION), CIVIL DEFENSE
SYSTEMS, RADIOACTIVE FALLOUT, GEOMETRIC FORMS, DESIGN,
CONSTRUCTION, ENVIRONMENTAL TESTS, TEMPERATURE, HEAT,
ANALYSIS, FLUID FLOW, MEASUREMENT, VELOCITY,
MATHEMATICAL PREDICTION, EQUATIONS, MATHEMATICAL
ANALYSIS (U)

TRANSIENT AND STEADY ANALYSIS ARE USED TO DETERMINE
THE PSYCHROMETRIC CONDITIONS THAT DEVELOP IN LARGE
ABOVEGROUND FALLOUT SHELTERS VENTILATED WITH
UNCONDITIONED AMBIENT AIR. THESE ANALYSES CONSIDER
THE SHELTER SIZE, GEOMETRY AND CONSTRUCTION, THE
PSYCHROMETRIC CONDITION OF THE AMBIENT WEATHER, AND
THE VARIOUS METABOLIC AND NONMETABOLIC HEAT LOADS TO
THE SHELTER AIR. THE RESULTS OF THIS STUDY
INDICATE THAT DURING THE HOT SUMMER WEATHER, ONLY A
SMALL FRACTION OF THE TOTAL ENERGY INPUT TO THE
SHELTER IS LOST THROUGH THE SHELTER BOUNDARY
SURFACES. THUS, THE VENTILATION REQUIREMENTS FOR
LARGE ABOVEGROUND SHELTERS CAN BE OBTAINED BY THE USE
OF AN ANALYSIS WHICH NEGLECTS THE HEAT LOSS THROUGH
THE SHELTER BOUNDARIES. THIS MEANS THAT
ABOVEGROUND SHELTER VENTILATION SYSTEMS SHOULD BE
DESIGNED TO REMOVE THE ENTIRE THERMAL LOAD GENERATED
WITHIN THE SHELTER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-600 064

GEORGIA UNIV ATHENS PSYCHOLOGICAL LABS
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA 1962-1963.

(U)

DESCRIPTIVE NOTE: APPENDICES TO FINAL REPT.

DEC 63 262P

CONTRACT: GCD 0562 226

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, SURVIVAL), (*CONFINEMENT
(PSYCHOLOGY), SHELTERS), CIVIL DEFENSE SYSTEMS,
REACTION (PSYCHOLOGY), PSYCHOPHYSIOLOGY, PHYSICAL
FITNESS, TRAINING, MEDICAL EXAMINATION, UNIVERSITIES,
STRESS (PSYCHOLOGY)

(U)

PSYCHOLOGICAL EFFECTS OF SHELTER OCCUPANCY.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-600 065

GAUTNEY AND JONES COMMUNICATIONS INC WASHINGTON, D C
STUDY AND DEVELOPMENT OF SPECIFICATIONS FOR PROTOTYPE
TRANSMITTERS AND RECEIVERS FOR FALLOUT SHELTER
COMMUNICATIONS SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.

MAY 64 71P

REPT. NO. TGGH642

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, COMMUNICATION SYSTEMS),
(*COMMUNICATION SYSTEMS, SHELTERS), CIVIL DEFENSE
SYSTEMS, TRANSMITTER-RECEIVERS, RADIO EQUIPMENT,
COSTS, SPECIFICATIONS (U)

A STUDY APPROACH TO THE PROBLEM OF DEVELOPING
SPECIFICATIONS FOR EQUIPMENT FOR A RADIO BACKUP TO A
LANDLINE FALLOUT SHELTER COMMUNICATIONS SYSTEM IS
DESCRIBED. CONSIDERATION IS GIVEN THOSE ASPECTS OF
SHELTER PROGRAM WHICH CONTRIBUTE REQUIREMENTS FOR
ELECTRICAL PERFORMANCE OF THE EQUIPMENTS.
DISCUSSIONS ARE INCLUDED CONCERNING FREQUENCY
AVAILABILITY AND USAGE, COST ANALYSIS, STATE OF THE
ART, AND RECOMMENDATIONS. THE REPORT INCLUDES FULL
SPECIFICATIONS FOR THREE TYPES OF RADIO EQUIPMENT.
A RADIO BACKUP TO A LANDLINE COMMUNICATIONS SYSTEM
WAS FOUND TO BE TECHNICALLY FEASIBLE. A
SUBSTANTIAL SAVINGS IN COSTS RELATIVE TO THAT OF
PRESENTLY AVAILABLE COMMERCIAL RADIO EQUIPMENT CAN BE
REALIZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-600 261

FACTORY MUTUAL RESEARCH CORP NORWOOD MASS
FIRE HAZARD TO FALLOUT SHELTER OCCUPANTS. A
CLASSIFICATION GUIDE. (U)

DESCRIPTIVE NOTE: FINAL RESEARCH REPT.

APR 64 40P SMITH, J. B.; COUSINS, E. W.;

NEWMAN, R. M.;

REPT. NO. FMRC15328

TASK: 1133A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FIRES, SHELTERS), (*SHELTERS, FIRES),
HAZARDS, BUILDINGS, STANDARDS, CLASSIFICATION, URBAN
AREAS, CIVIL DEFENSE SYSTEMS (U)

THIS CLASSIFICATION GUIDE WAS PREPARED FOR THE USE
OF ARCHITECTS AND ENGINEERS. THE GUIDE WAS FIELD-
TESTED BY SEVERAL ARCHITECTS AND A CONSULTING
ENGINEER. TRIAL SURVEYS WERE MADE AT EXISTING
DESIGNATED SHELTERS IN BUILDINGS OF VARIED
CONSTRUCTION, OCCUPANCY, AND AGE, IN RELATIVELY
CONGESTED AREAS. THE GUIDE WAS FOUND TO BE SIMPLE
AND EASY TO USE. CONSISTENT RESULTS WERE OBTAINED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-600 759

EDISON (THOMAS A) RESEARCH LAB WEST ORANGE N J
ENVIRONMENTAL INSTRUMENT PACKAGE FOR A CIVIL DEFENSE
SHELTER. (U)

DESCRIPTIVE NOTE: SUMMARY OF RESEARCH REPT.

MAY 64 6P

CONTRACT: OCD OS62 216

TASK: 1232B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HEALTH PHYSICS INSTRUMENTATION),
(*CIVIL DEFENSE SYSTEMS, SHELTERS), (*INSTRUMENTATION,
ENVIRONMENTAL TESTS), (*ENVIRONMENTAL TESTS,
INSTRUMENTATION), AIR POLLUTION, RADIOLOGICAL
CONTAMINATION, HAZARDS, SAFETY (U)

AN INSTRUMENT EVALUATION REVEALED DEFICIENCIES IN
EVERY DEVICE OF EXISTING EQUIPMENT. RECOMMENDED
REVISIONS TO EXISTING EQUIPMENT RELATE TO: (1)
INSTRUCTION MATERIAL, (2) SHELF LIFE, (3)
AIR SAMPLING, AND (4) NEW INSTRUMENTS. THESE
INCLUDE: (1) EFFECTIVE TEMPERATURE INDICATOR,
(2) FILAMENT TYPE HYGROMETER, (3) GLASS TUBE
FOR OXYGEN, (4) CARBON DIOXIDE DETECTOR, AND
(5) EXPOSURE DETECTORS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-600 994

MICHIGAN STATE UNIV EAST LANSING COLL OF COMMUNICATION
ARTS

CIVIL DEFENSE BELIEF PATTERNS: (III) FALLOUT
SHELTERS AND RADIATION.

(U)

DESCRIPTIVE NOTE: COMMUNICATION RESEARCH REPT.

APR 63 81P MACLEAN, MALCOLM S. JR.;

DANBURY, THOMAS; TALBOTT, ALBERT D.;

CONTRACT: OGD 0562 19

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ATTITUDES, CIVIL DEFENSE SYSTEMS),
(*SHELTERS, ATTITUDES), (*ATTITUDES, RADIOACTIVE
FALLOUT), PUBLIC OPINION, APPLIED PSYCHOLOGY,
PERSONALITY

(U)

A DESCRIPTION AND TABULAR SUMMARY ARE GIVEN OF THE
FOUR MAJOR TYPES OF PERSONS ON THE BASIS OF THEIR
PATTERNS OF BELIEF ABOUT FALLOUT SHELTERS AND
RADIATION.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-601 467

HUGHES AIRCRAFT CO FULLERTON CALIF

OCD SOFT TARGET STUDY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

APR 64 213P

REPT. NO. FR-64-16-66

CONTRACT: OCD OS62 277

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, EFFECTIVENESS),
SHELTERS, NUCLEAR EXPLOSION DAMAGE, NUCLEAR WARFARE
CASUALTIES, RADIATION EFFECTS, COSTS, PROGRAMING
(COMPUTERS), COMPUTERS (U)

THIS REPORT DESCRIBES METHODOLOGY AND ORIGINAL
COMPUTER PROGRAMS WHICH HAVE BEEN DEVELOPED TO ASSIST
IN THE ACCOMPLISHMENT OF THE STUDY OBJECTIVE. TWO
COMPUTER PROGRAMS ARE EMPHASIZED. THE DYNAMIC
ANALYZER PROGRAM CALCULATES THE EFFECTIVENESS OF
SPECIFIED SHELTER SYSTEMS IN PROTECTING THE
POPULATION FROM PARTICULAR ATTACKS. POPULATION
MOBILITY AND FALLOUT FIELDS WHICH DEPEND ON BOTH TIME
AND POSITION ARE CONSIDERED. THE WEIGHTED-
STRATEGY, MULTIPLE SHELTER TYPE MIX AND
LOCATION OPTIMIZER COMPUTES THE OPTIMAL
EFFECTIVENESS VERSUS COST CURVE OVER THE RANGE FROM
ZERO COST TO THE COST OF THE MOST EFFECTIVE SYSTEM
POSSIBLE WITH A GIVEN SHELTER CATALOG. THIS
PROGRAM ALSO DETERMINES THE MIX AND DEPLOYMENT OF
SHELTERS AT DESIRED COST/EFFECTIVENESS LEVELS.
SOFT TARGET STUDY ACTIVITY HAS SHOWN THAT THERE
IS A DIFFERENCE IN THE INTENSITY AND RELATIVE
INTENSITY OF THE DIFFERENT WEAPON EFFECTS FOR CITIES
NEAR SOFT AND HARD TARGETS. HOWEVER, ALL WEAPON
EFFECTS NEED TO BE CONSIDERED FOR BOTH CASES. THE
SIGNIFICANCE OF THIS FACT IS THAT THE PROCEDURES
DEVELOPED UNDER THE SOFT TARGET STUDY MAY BE
APPLIED TO THE STUDY OF CIVIL DEFENSE
COUNTERMEASURES FOR CITIES IN ANY TARGETING
SITUATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-602 846

HUDSON INST INC HARMON-ON-HUDSON N Y
ON SHELTER COSTS, (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JUN 64 22P KRUPKA, ROBERT A. ;
REPT. NO. 361-RR/3
CONTRACT: OCD 0563 122
TASK: 41130

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, COSTS), FUNCTIONS, ANALYSIS,
BLAST, DESIGN, OPTIMIZATION, CIVIL DEFENSE
SYSTEMS (U)

STUDIES ON OPTIMIZING BLAST SHELTER PROGRAMS
REVEALED THAT A SHELTER COST-HARDNESS RELATIONSHIP IS
REQUIRED IN ORDER TO DESIGN PROGRAMS AND MEASURE
THEIR PERFORMANCE. THE PAPER PRESENTS THE RESULTS
OF A LIMITED EFFORT TO DEVELOP A SIMPLE COST FUNCTION
FOR BLAST SHELTERS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-602 847

HUDSON INST INC HARMON-ON-HUDSON N Y

ALTERNATIVE CIVIL DEFENSE PROGRAMS AND POSTURES. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

JUN 64 38P BROWN, WILLIAM M. I

REPT. NO. 361-RR/1

CONTRACT: OCD 0563 122

TASK: 4113D

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, DESIGN), (*CIVIL DEFENSE SYSTEMS, THEORY), (*MILITARY STRATEGY, GAME THEORY), WARFARE, POLITICAL SCIENCE, BLAST, RADIOACTIVE FALLOUT, BUDGETS, TABLES (U)

A SPECTRUM OF POSSIBLE CD PROGRAMS IS PRESENTED RANGING FROM A MINIMUM (APPROXIMATELY THE CURRENT SURVEY SHELTER PROGRAM) BASED ON A \$200 MILLION BUDGET TO A MAXIMUM SUSTAINED NATIONAL EFFORT, LIMITED ONLY BY AVAILABLE RESOURCES. TO PLACE THESE ALTERNATIVES IN PERSPECTIVE, SOME ASPECTS OF FUTURE CONTEXTS WITHIN WHICH THEY MIGHT APPEAR DESIRABLE ARE DESCRIBED. SEVEN SPECIFIC POSTURES ARE SELECTED AND DESCRIBED IN TERMS OF THE FALLOUT AND BLAST PROTECTION ACHIEVED PRIOR TO AN ATTACK. THE TWO MAIN CONCLUSIONS DRAWN ARE (1) THAT IN SOME POPULATION ATTACKS THE EMERGENCY IMPROVEMENTS IN CD CAPABILITY WITHIN THE LOW BUDGET PROGRAMS HAVE A POTENTIAL FOR PRESERVING THE NATION AS AN ENTITY AND/ OR MOST OF ITS URBAN POPULATION; AND (2) THAT THE LARGER PROGRAMS, BASED UPON BLAST SHELTERS IN OR NEAR THE URBAN AREAS, WHEN PROPERLY DESIGNED OFFER A MUCH GREATER POTENTIAL FOR SURVIVAL OF MALEVOLENT ATTACKS THAN HAS BEEN GENERALLY REALIZED HERETOFORE.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-602 848

HUDSON INST INC HARMON-ON-HUDSON N Y
OVERCROWDING POTENTIAL.

DESCRIPTIVE NOTE: FINAL REPT.

(U)

JUN 64 30P KRUPKA, ROBERT A.
REPT. NO. 361-RR/4
CONTRACT: OCD 0563 122
TASK: 41130

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, PERFORMANCE (ENGINEERING)),
DESIGN, OPTIMIZATION, SURVIVAL, COSTS, VOLUME, WATER
SUPPLIES, STRESS (PHYSIOLOGY), STRESS (PSYCHOLOGY),
CIVIL DEFENSE SYSTEMS, HUMAN ENGINEERING (U)

THE PAPER EXPLORES SOME POSSIBILITIES OF INCREASING
BLAST SHELTER PERFORMANCE (LESS COST, MORE
HARDNESS, OR BOTH) BY USING SHELTER SPACE BEYOND
DESIGN CAPACITY. IT SUGGESTS THAT SHELTERS MIGHT
REASONABLY BE OVERCROWDED 150% (6 PEOPLE IN 2
SHELTER SPACES) FOR EXTENDED PERIODS AND THAT MORE
SEVERE OPTIONS ARE POSSIBLE FOR SHORTER PERIODS.
THE STUDY GIVES SOME BACKGROUND INFORMATION SHOWING
THAT SHELTER DESIGNERS HAVE RADICALLY REDUCED SPACE
ALLOCATIONS DURING THE PAST FEW YEARS. AN EXAMPLE
OF OVERCROWDING PERFORMANCE IS INCLUDED. THE PAPER
ALSO SUGGESTS THAT PHYSIOLOGICAL STRESS (HEAT,
HUMIDITY, LACK OF WATER, ETC.) RATHER THAN
PSYCHOLOGICAL STRESS IS ALWAYS USED AS THE LIMITING
FACTOR IN THE UTILIZATION OF SHELTER SPACE AND THAT
THE PROBLEM CAN ESSENTIALLY BE BY-PASSED BY
FURNISHING SHELTERS WITH WATER WELLS. OVERCROWDING
BE GIVEN SERIOUS CONSIDERATION IN DEVELOPING SHELTER
PROGRAMS, SINCE IT MAY RESULT IN OVER-ALL COST
REDUCTIONS, PURCHASE OF HARDER SYSTEMS, FAST
CAPABILITIES, HIGHER LEGACY VALUES, OPTIMUM PHASING
OF PROGRAMS, OR A COMBINATION OF THESE. SYSTEMS
USING WELL WATER AND DESIGNED FOR OVERLOADING INCUR
SMALL INCREASES OVER NORMAL SHELTER COSTS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-602 850

HUDSON INST INC HARMON-ON-HUDSON N Y

THE DESIGN AND PERFORMANCE OF *OPTIMUM* BLAST SHELTER
PROGRAMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.

JUN 64 53P

BROWN, WILLIAM M. :

REPT. NO. 361-RR/2

CONTRACT: OCD OS63 122

TASK: 41130

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, COSTS), CIVIL DEFENSE
SYSTEMS, MATHEMATICAL MODELS, PERFORMANCE
(ENGINEERING), OPTIMIZATION, MILITARY STRATEGY, BLAST,
NUCLEAR EXPLOSIONS, POPULATION, URBAN AREAS, DESIGN,
EFFECTIVENESS (U)

THE PAPER DEVELOPS A MATHEMATICAL MODEL FROM WHICH
THE COST OF A NATIONAL BLAST SHELTER PROGRAM FOR THE
213 URBANIZED AREAS OF THE U.S. CAN BE CALCULATED,
AND FROM WHICH THE EFFECTIVENESS OF THE PROGRAM IN
PROVIDING BLAST PROTECTION FOR THE URBAN CITIZENS CAN
BE QUICKLY FOUND. THE PAPER, BY UTILIZING THE IDEA
OF EQUALIZING THE VALUE OF ALL URBAN AREAS AS TARGETS
(FROM THE ENEMY POINT OF VIEW), (A) DENIES THE
ENEMY ANY PREFERRED TARGETS, FROM THE POINT OF VIEW
OF POPULATION MORTALITIES, AND (B) PROVIDES AN
IMPORTANT KIND OF EQUALITY OF POPULATION
VULNERABILITY AMONG THE URBAN AREAS. FOR ANY GIVEN
BUDGET THE FUNDS SPENT FOR PROTECTING A CITIZEN IN A
MORE CONGESTED AREA WOULD BE SOMEWHAT GREATER THAN
FOR THOSE IN LESS CONGESTED AREAS WHICH, NORMALLY,
WOULD BE A LESS LIKELY TARGET. FROM A NATIONAL
POINT OF VIEW, IT IS BELIEVED THAT THE DESIGN HAS THE
ADVANTAGE OF MINIMIZING THE NUMBER OF BLAST
FATALITIES WHICH AN ENEMY CAN ACHIEVE, AND THEREBY
CAN CONTRIBUTE TO THE REDUCTION OF NATIONAL
VULNERABILITY. TO A LARGE EXTENT THE DESIGN IS
INDEPENDENT OF THE SIZE AND NATURE OF THE ASSUMED
ATTACK, ALTHOUGH THIS IS LESS TRUE OF THE LATER
REFINEMENTS WHICH INVOLVE THE USE OF PARTIAL
DISPERSAL AND CROWDING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-603 058

BATTILLE MEMORIAL INST COLUMBUS OHIO

MINIMUM REQUIREMENTS FOR AUXILIARY POWER SYSTEMS FOR
COMMUNITY SHELTERS. (U)

DESCRIPTIVE NOTE: SUMMARY REPT.,

JUL 64 186P

TRAYSER, D. A.; FLANIGAN, L. J.

TALBERT, S. G. ;

CONTRACT: OGD 0562 190

TASK: 1400

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON SHELTER RESEARCH,
COMPONENT DEVELOPMENT, LARGE AUXILIARY POWER
SYSTEMS.

DESCRIPTORS: (*SHELTERS, CIVIL DEFENSE SYSTEMS),
(*AUXILIARY POWER PLANTS, CIVIL DEFENSE SYSTEMS),
DESIGN, INSTALLATION, OPERATION, MAINTENANCE,
STARTING, COOLING, FUELS, STORAGE, ENGINE PRIMERS, GAS
TURBINES, STEAM POWER PLANTS, DIESEL ENGINES, IGNITION
SYSTEMS, NOISE, VIBRATION, EXHAUST GASES, RECOVERY,
COSTS, SAFETY, POWER EQUIPMENT (U)

THE RESULTS OF THIS STUDY SHOW THAT THE MINIMUM
REQUIREMENTS FOR INSTALLATION, OPERATION, AND
MAINTENANCE OF SHELTER AUXILIARY POWER SYSTEMS CAN
GENERALLY BE MET WITH COMMERCIALY AVAILABLE
EQUIPMENT NOW IN COMMON INDUSTRIAL USE. TO
FACILITATE THE USE OF THE INFORMATION IN THIS REPORT,
THE PRESENTATION OF RESULTS IS DIVIDED INTO TEN
SECTIONS. THE MATERIAL IN THESE SECTIONS IS
SUMMARIZED HERE IN THE SAME SEQUENCE, NAMELY:
PRIME MOVERS, STARTING SYSTEMS, COOLING, FUEL
STORAGE, WASTE HEAT RECOVERY, POWER TRANSMISSION
SYSTEMS, MOUNTINGS AND DRIVES, NOISE AND
VIBRATION, STAND-BY MAINTENANCE, AND
DEMONSTRATION UNIT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-607 127

GONESCO INC CAMBRIDGE MASS

DESCRIPTION: EXPERIMENTAL CALIBRATION, AND ANALYSIS
OF THE RADIATION TEST FACILITY AT THE PROTECTIVE
STRUCTURES DEVELOPMENT CENTER. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.

SEP 64 76P MCDONNELL, C. IVELLETRI, J. &

STARBIRD, A. W. BATTER, J. F. &

CONTRACT: DA18 020ENG3096

MONITOR: PSDC . TRI4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: LEGIBILITY OF THIS DOCUMENT IS IN PART
UNSATISFACTORY.

DESCRIPTORS: (*SHELTERS, MODELS (SIMULATIONS)),
(*RADIOLOGICAL CONTAMINATION, SHELTERS), CALIBRATION,
DOSE RATE, DOSIMETERS, RADIATION MONITORS, STEEL,
STRUCTURES, CIVIL DEFENSE SYSTEMS, RADIOACTIVE
FALLOUT, SHIELDING, INSTRUMENTATION, TEST EQUIPMENT,
COBALT, EQUATIONS, GEOMETRIC FORMS, STANDARDIZATION,
EXPERIMENTAL DATA (U)

THE INITIAL CALIBRATION EXPERIMENTS PERFORMED AT
THE RADIATION TEST FACILITY OF THE PROTECTIVE
STRUCTURES DEVELOPMENT CENTER ARE DESCRIBED AND
THEIR RESULTS ANALYZED. THE DOSE RATE ABOVE AN
OPEN FIELD AND THE ATTENUATION AFFORDED BY THE STEEL
FRAME OF THE TEST STRUCTURE IS CALCULATED AND FOUND
TO AGREE WELL WITH EXPERIMENT WHEN MODIFIED
CALCULATIONAL PROCEDURES ARE USED. THE CUMULATIVE
ANGULAR DISTRIBUTION OF DIRECT RADIATION IS FOUND TO
BE AS MUCH AS FOURTEEN PERCENT ABOVE THAT PREDICTED
BY THEORY OVER THE RANGE INVESTIGATED. SEVERAL
MODIFICATIONS OF PRESENTLY USED CALCULATIONAL
TECHNIQUES ARE SUGGESTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-609 480

AMERICAN INST FOR RESEARCH PITTSBURGH PA
OCCUPANCY EXERCISE RESEARCH GUIDE: AN INTRODUCTION
TO THE RESEARCH USE OF THE SHELTER EXERCISE FOR
TRAINING. (U)

OCT 64 29P

CONTRACT: OCD OS63 97

TASK: 1517A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS, TRAINING),
(SHELTERS, MANAGEMENT ENGINEERING), (TRAINING,
SCIENTIFIC RESEARCH), CONFINED ENVIRONMENTS, STUDENTS,
MANAGEMENT PLANNING, RESEARCH PROGRAM ADMINISTRATION,
OPERATIONS RESEARCH, PERFORMANCE TESTS, ADJUSTMENT
(PSYCHOLOGY), HUMAN ENGINEERING, SURVIVAL, CIVIL
DEFENSE PERSONNEL, ATTITUDES, GROUP DYNAMICS (U)

AN OCCUPANCY EXERCISE MAY BE DEFINED AS A PLANNED
PORTION OF A CIVIL DEFENSE TRAINING COURSE IN WHICH
STUDENTS ARE BROUGHT TOGETHER FOR AN EXTENDED PERIOD
OF TIME TO EXPERIENCE SOME OF THE CONDITIONS OF
SHELTER LIVING. THE PURPOSE OF THE DOCUMENT IS TO
PRESENT GUIDELINES FOR OBTAINING RESEARCH DATA FROM
OCCUPANCY TRAINING EXERCISES. IT IS INTENDED FOR
AN AUDIENCE OF PERSONS WHO ARE KNOWLEDGEABLE ABOUT
SHELTER MANAGEMENT BUT WHO HAVE HAD LITTLE OR NO
FORMAL TRAINING IN BEHAVIORAL SCIENCE RESEARCH. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-609 734

NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
THE DESIGN AND PERFORMANCE OF A FALLOUTTESTED MANNED
SHELTER STATION AND ITS SUITABILITY AS A SINGLE-
FAMILY SHELTER, (U)

APR 63 54P SARTOR, J. D. LARIVIERE, P. D.
LEE, H. POND, J. I. I
MONITOR: USNRDL, TR647

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, RADIOACTIVE FALLOUT),
(*CIVIL DEFENSE SYSTEMS, SHELTERS), DESIGN, COSTS,
PERFORMANCE (ENGINEERING), NUCLEAR EXPLOSION DAMAGE,
ENVIRONMENTAL TESTS, SPECIFICATIONS, EXPLOSION
EFFECTS, GAMMA RAYS, ATTENUATION, UNDERGROUND
STRUCTURES, STEEL (U)
IDENTIFIERS: PLUMBBOB OPERATION (U)

THE DESIGN DETAILS, COST ANALYSIS AND PERFORMANCE
CHARACTERISTICS ARE PRESENTED FOR SMALL,
PARTIALLYUNDERGROUND FALLOUT SHELTERS UTILIZED AS
MANNED STATIONS DURING A NUCLEAR WEAPON EFFECTS TEST.
FOUR MEN OCCUPIED EACH SHELTER AND OPERATED
RADIATION MEASUREMENT AND FALLOUT COLLECTION
INSTRUMENTS. TWO TYPES OF SHELTERS WERE DESIGNED
TO WITHSTAND PREDICTED OVERPRESSURES: TYPE I FOR
A 1-PSI OVERPRESSURE AND TYPE II FOR A 5-PSI
OVERPRESSURE. THE BASIC STRUCTURE CONSISTED OF AN
8-FT DIAMETER, 10-FT LONG, 12-GAGE CORRUGATED STEEL,
MULTI-PLATE PIPE. A STEEL ENTRANCEWAY
INCORPORATING TWO RIGHT-ANGLE TURNS PROVIDED ACCESS
TO THE BASIC STRUCTURE. DEPENDING UPON THE AMOUNT
OF SOIL BACKFILL, FALLOUT GAMMA RADIATION PROTECTION
FACTORS UP TO 470,000 WERE OBTAINED. THE OVERALL
PERFORMANCE OF THE SHELTERS UNDER THE CONDITIONS
EXPERIENCED WAS EXCELLENT. IT IS SUGGESTED THAT
SHELTERS OF THIS TYPE HAVE APPLICATION NOT ONLY FOR
USE AS MANNED STATIONS IN NUCLEAR WEAPON TESTING BUT
CAN BE ADAPTED AS WELL FOR USE IN RESIDENTIAL AREAS
AS SINGLE-FAMILY FALLOUT SHELTERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-609 752

BUREAU OF SOCIAL SCIENCE RESEARCH INC WASHINGTON D C
HISTORICAL INCIDENTS OF EXTREME OVERCROWDING. (U)
DESCRIPTIVE NOTE: FINAL REPT.;
MAR 63 194P BIDERMAN, ALBERT D. ;
LOURIA, MARGOT ; BACCHUS, JOAN;
REPT. NO. BSSR-354-5
CONTRACT: OCD 0562 122

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, HOUSING),
(*SHELTERS, CIVIL DEFENSE SYSTEMS), (*HOUSING,
HISTORY), (*GROUP DYNAMICS, HOUSING), PRISONERS,
CASUALTIES, REFUGEES, HOSPITALS, MENTAL DISORDERS,
JAPAN, UNITED STATES POPULATION, ISRAEL, MILITARY
PERSONNEL, TRANSPORTATION (U)
IDENTIFIERS: CROWDING (PEOPLE), CIVIL WAR, SLAVERY, (U)
EMIGRATION

THE PRIMARY ORIENTATION OF THE REVIEW WAS TO GAIN
KNOWLEDGE OF POSSIBLE HAZARDS TO LIFE AND HEALTH
UNDER CONDITIONS OF OVERCROWDING THAT MIGHT OCCUR IN
CIVIL DEFENSE SHELTERS. VARIOUS TYPES OF
HISTORICAL INCIDENTS HAVE PRODUCED DEGREES OF
CROWDING--ALONG WITH ASSOCIATED NOXIOUS AND
DEPRIVATIONAL CIRCUMSTANCES--FAR MORE SEVERE AND OF
LONGER DURATION THAN HAS BEEN OR CAN BE SUBJECT TO
EXPERIMENTAL TEST. CONDITIONS BEYOND THOSE
ORDINARILY ACCEPTED AS THE LIMITS OF HUMAN TOLERANCE
HAVE BEEN WITHSTOOD ON MANY OCCASIONS BY LARGE
PROPORTIONS OF THE VICTIMS OF CERTAIN CATASTROPHIC
OCCURRENCES. IN A NUMBER OF OTHER CIRCUMSTANCES,
INCLUDING SOME INVOLVING ONLY MODERATELY INTENSE
CROWDING, VERY HIGH DEATH AND IMPAIRMENT RATES HAVE
BEEN PRESENT. PHYSICAL CROWDING, PER SE, IS NOT
REGARDED AS A FRUITFUL UNITARY CONCEPT FOR EXAMINING
THE DIFFERENCES BETWEEN HIGH AND LOW CASUALTY EVENTS.
FOR MOST OF THE RANGE OF DENSITIES, PHYSICAL
CROWDING HAS SIGNIFICANCE ONLY IN INTERDEPENDENT
RELATIONSHIP WITH MANY OTHER VARIABLE FEATURES OF THE
ENTIRE SITUATION, INCLUDING ENVIRONMENTAL,
STRUCTURAL, TEMPORAL, PSYCHOLOGICAL, AND SOCIAL
FEATURES. THE ACTS OF OPPRESSIVE CAPTORS AND
EPIDEMIC DISEASE WERE THE MOST FREQUENT DIRECT CAUSES
OF HIGH FATALITY IN THE INCIDENTS REVIEWED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-610 406

FLORIDA UNIV GAINESVILLE ENGINEERING AND INDUSTRIAL
EXPERIMENT STATION

SECOND SIMULATED OCCUPANCY TEST, SUMMERLIN
SHELTER. (U)

DESCRIPTIVE NOTE: REPT. FOR 9-20 APR 63,

APR 63 212P GONZALEZ, JUAN O., JR. I

FLANIGAN, F. M.; FAIRCHILD, F. M. I

CONTRACT: OCD OS62 116

TASK: 1212A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, SURVIVAL), (*CIVIL DEFENSE
SYSTEMS, SHELTERS), (*ENVIRONMENTAL TESTS, SHELTERS),
CONTROLLED ATMOSPHERES TEMPERATURE, HUMIDITY,
CONTROL, VENTILATION, HEAT PRODUCTION (BIOLOGY),
THERMAL PROPERTIES, METABOLISM, SIMULATION,
EVAPORATION, HEAT ENGINES, THERMOCOUPLES, TANKS
(CONTAINERS), AIR CONDITIONING EQUIPMENT, EXPERIMENTAL
DATA, UNDERGROUND STRUCTURES, PROTECTIVE COVERINGS (U)
IDENTIFIERS: FALLOUT SHELTERS, CLEAN ROOMS (U)

A SIMULATED OCCUPANCY TEST WAS CONDUCTED ON AN
EIGHTEEN OCCUPANT, TOTALLY BURIED, TANK-TYPE SHELTER
LOCATED AT GAINESVILLE, FLORIDA. VENTILATION
AIR TO THE SHELTER WAS SUPPLIED BY TEST EQUIPMENT
WHICH PERMITTED CONTROL OF ITS TEMPERATURE AND
HUMIDITY TO MATCH TYPICAL 'DESIGN DAYS' TO BE
EXPECTED AT THIS LOCATION DURING THE MONTHS OF
APRIL AND AUGUST. THE TEST WAS CONDUCTED
DURING THE MONTH OF APRIL IN ORDER TO AFFORD A
COMPARISON WITH A PREVIOUS TEST CONDUCTED DURING
JULY, WHEN GROUND TEMPERATURES HAD BEEN HIGHER. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-610 819

FACTORY MUTUAL RESEARCH CORP NORWOOD MASS
FIRE SAFETY UPGRADING FOR FALLOUT SHELTERS IN
BUILDINGS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

NOV 64 17P SMITH, JAMES B. ;

COUSINS, EDWARD W. ; MILLER, MYRON J. ;

NEWMAN, R. MURRAY ;

REPT. NO. FMRC-15903

CONTRACT: N228 62479 65613

TASK: 113A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, FIRE SAFETY), (*FIRE SAFETY,
BUILDINGS), CIVIL DEFENSE SYSTEMS, RADIOACTIVE
FALLOUT, FIRES, HAZARDS, FIRE ALARM SYSTEMS, FIRE
EXTINGUISHERS, THERMAL INSULATION, PERSONNEL,
ANALYSIS, CONSTRUCTION

(U)

IDENTIFIERS: FALLOUT SHELTERS

(U)

THE REPORT SUGGESTS METHODS, MAINLY UNTRIED, FOR
UPGRADING ON AN EMERGENCY BASIS THE FIRE SAFETY OF
EXISTING FALLOUT SHELTER BUILDINGS. THE METHODS
SUGGESTED ARE NOT SUBSTITUTES FOR NORMAL PEACETIME
PROTECTION WHICH MAY BE: (1) HARD TO IMPLEMENT;
(2) TOO COSTLY; OR (3) INCOMPATIBLE WITH
FLEXIBILITY OF BUILDING OPERATIONS. THE REPORT IS
BASED ON THE FOLLOWING CONCEPTS: (1) FIRE
EXPOSURES TO A SHELTER BUILDING FROM WITHOUT MUST BE
DENIED ENTRY TO THE SHELTER BUILDING, (2) FIRES
IN A SHELTER BUILDING MUST BE PROMPTLY DETECTED AND
SUPPRESSED OR EXTINGUISHED, AND (3) OCCUPANTS
MUST BE PROVIDED WITH AN ENVIRONMENT WHICH WILL
SUSTAIN LIFE. MOST OF THE REMEDIES SUGGESTED ARE
PASSIVE SUCH AS PHYSICAL BARRIERS TO PREVENT FIRE
ENTRY TO THE SHELTER BUILDING. SPECIFICALLY,
THERMAL BARRIERS FOR WINDOW OPENINGS, AUTOMATIC SMOKE
DETECTORS WITH MANUAL RESPONSE BY FIRE FIGHTING
SHELTER PERSONNEL, AND ENVIRONMENTAL SEALS FOR
SHELTER AREAS ARE RECOMMENDED AS FEASIBLE UPGRADING
REMEDIES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BHL27

AD-611 231

HEALTH AND SAFETY LAB ATOMIC ENERGY COMMISSION NEW YORK

PROTECTION AGAINST FALLOUT RADIATION IN A SIMPLE STRUCTURE, (U)

APR 62 SSP BRESLIN, A. J.; LOYSEN, P. J.; WEINSTEIN, M. S. ;

PROJ: 32 1

MONITOR: WT , 1462

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON OPERATION PLUMBBOB, NEVADA TEST SITE, MAY-OCT 57.

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHIELDING), (*SHIELDING, RADIOACTIVE FALLOUT), (*CIVIL DEFENSE SYSTEMS, RADIOACTIVE FALLOUT), SHELTERS, PROTECTIVE COVERINGS, STRUCTURES, GAMMA RAYS, DOSE RATES, RADIATION MEASUREMENT SYSTEMS, HEALTH PHYSICS IDENTIFIERS: PLUMBBOB OPERATION (U) (U)

A REINFORCED BUTLER BUILDING WAS EXPOSED TO FALLOUT FROM SHOTS DIABLO AND SHASTA, AND THE RESULTING DOSE RATES AND FALLOUT DEPOSITION INSIDE AND OUTSIDE THE STRUCTURE WERE MEASURED WITH VARIOUS INSTRUMENTS AND TECHNIQUES. PROTECTION FACTORS AND ROOF AND GROUND CONTRIBUTIONS TO THE TOTAL DOSE RATES AT POINTS WITHIN THE STRUCTURE WERE DETERMINED FROM THE MEASUREMENTS. COMPARISONS WERE MADE WITH THE RESULTS OF THEORETICAL AND OTHER EXPERIMENTAL STUDIES. INFORMATION OBTAINED FROM THIS EXPERIMENT SHOULD BE OF VALUE AS BASIC EXPERIMENTAL DATA FOR FALLOUT PROTECTION WORK, ALTHOUGH IT IS RECOMMENDED THAT ADDITIONAL SUBSTANTIATIVE DATA BE OBTAINED UNDER MORE CONTROLLED CONDITIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-611 764

DUNLAP AND ASSOCIATES INC DARIEN CONN
REQUIREMENTS FOR LOCAL PLANNING TO COVER HAZARDS OF
FALLOUT. VOLUME 1. (U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 1.

JAN 65 63P

REPT. NO. DRD-64-110 VOL. 1

CONTRACT. OGD US63 161

TASK: 4531A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, EFFECTIVENESS),
(*SHELTERS, MANAGEMENT PLANNING), POPULATION,
DISTRIBUTION, TRAFFIC, PASSENGER VEHICLES, FIRES, FIRE
SAFETY, HAZARDS, RADIOACTIVE FALLOUT, LINEAR
PROGRAMMING, CONNECTICUT (U)

THE STUDY CONCENTRATED UPON DEVELOPING EFFECTIVE
PLANS FOR ASSIGNING SHELTERS TO POPULATION, AND FOR
BRINGING THE POPULATION TO THE SHELTER. TWO
MEDIUM-SIZED TOWNS IN CONNECTICUT, STAMFORD AND
WATERBURY, WERE STUDIED IN DETAIL. FOR EACH
TOWN, A STUDY WAS MADE ON THE EFFECTIVENESS OF A
NUMBER OF PLANS OF VARYING DETAIL AND COMPLEXITY IN
GETTING PEOPLE TO SHELTER. IN ALL PLANS IT WAS
ASSUMED THAT ENOUGH TRAFFIC CONTROL WOULD BE SET UP
TO AVOID BLOCKAGES OF TRAFFIC NEAR SHELTERS, AND THAT
THE POPULATION WOULD KNOW TO WHAT SHELTER AREAS THEY
HAD BEEN ASSIGNED, AND HOW THEY WERE SUPPOSED TO GET
THERE. TWO TYPES OF SHELTER ASSIGNMENT WERE MADE:
THE FIRST WAS BY CENSUS TRACT, THE SECOND BY
INDIVIDUAL LOCATION. IN THE FIRST, PEOPLE FROM
SHELTER-POOR CENSUS TRACTS WERE DIRECTED TO SHELTER-
RICH CENSUS TRACTS, ACCORDING TO A LINEAR PROGRAMMING
METHOD AIMED AT MINIMIZING DISTANCE TRAVELED. IN
THE SECOND, A SIMILAR METHOD WAS USED TO ASSIGN
PEOPLE TO ACTUAL BUILDINGS. STUDIES WERE MADE OF
VARIOUS SPEEDS OF MOVEMENT TO SHELTER AND THEIR
EFFECTS UPON RATE AT WHICH THE POPULATION WAS
SHELTERED. PLANNING PROBLEMS ASSOCIATED WITH
PRIMARY AND SECONDARY FIRES WERE GIVEN CURSORY
EXAMINATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 78ML27

AD-611 766

DUNLAP AND ASSOCIATES INC DARIEN CONN
REQUIREMENTS FOR LOCAL PLANNING TO COVER HAZARDS OF
FALLOUT. VOLUME II. APPENDICES. (U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 2.

JAN 65 111P

REPT. NO. DRD-34-110 VOL. 2

CONTRACT: OCD 0563 161

TASK: 4631A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-611 764.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS; EFFECTIV- 1961;
(*SHELTERS, MANAGEMENT PLANNING), (*TRAFFIC,
MATHEMATICAL MODELS), POPULATION, PASSENGER VEHICLES,
MATHEMATICAL ANALYSIS, RADIOACTIVE FALLOUT, HAZARDS,
DISTRIBUTION, TIME, EQUATIONS, CONNECTICUT (U)

REQUIREMENTS FOR LOCAL PLANNING TO COVER HAZARDS OF
FALLOUT; APPENDICES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-612 254

AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
LABORATORY INVESTIGATIONS OF SHELTER MANAGEMENT
FACTORS. (U)

JAN 65 246P HALE, JOHN F. ;
ROSENFELD, MICHAEL ; BERKOWITZ, MORRIS I. ;
REPT. NO. AIR-D-93A-1/65-TR
TASK: 1519A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, MANAGEMENT ENGINEERING),
(*CIVIL DEFENSE PERSONNEL, LEADERSHIP), CIVIL DEFENSE
SYSTEMS, NUCLEAR WARFARE, SIMULATION, SOCIAL
PSYCHOLOGY, GROUP DYNAMICS, ATTITUDES, BEHAVIOR,
CONFINED ENVIRONMENTS, STRESS (PSYCHOLOGY), STRESS
(PHYSIOLOGY), DECISION MAKING, POPULATION (U)
IDENTIFIERS: FALLOUT SHELTERS, PROBLEM SOLVING (U)

A RESEARCH PROGRAM IS REPORTED IN WHICH SEVERAL
SHELTER EXERCISES WERE CONDUCTED TO INVESTIGATE
SHELTER MANAGEMENT FACTORS. THE RESULTS OF THIS
PROGRAM INDICATED THAT: (1) THE MOST EFFICIENT
OPERATION OF THE SHELTER OCCURED WHEN THE MANAGER WAS
PRESENT FROM THE BEGINNING OF THE EXERCISE. (2)
THE EFFECTIVENESS OF OPERATION IN THE ABSENCE OF THE
TRAINED MANAGER DEPENDED UPON THE ATTITUDE TOWARD THE
EXERCISE OF THE EMERGENT SHELTER LEADER, AND UPON THE
WAY IN WHICH HE EMPLOYED THE IN-SHELTER GUIDANCE
MATERIALS. (3) A MANAGEMENT STYLE IN WHICH
APPROXIMATELY EQUAL ATTENTION IS GIVEN TO BOTH
TECHNICAL AND NON-TECHNICAL PROBLEM AREAS WAS MUCH
MORE EFFECTIVE THAN STYLES IN WHICH MORE ATTENTION IS
GIVEN TO ONE OF THESE AREAS AT THE EXPENSE OF THE
OTHER. (4) COMPLETE DARKNESS IN A SHELTER WAS
FOUND TO BE TOLERABLE FOR 24 HOURS BY A GROUP OF
VOLUNTEERS FROM THE RESEARCH STAFF OF A.I.R. THIS
FINDING SHOULD BE VIEWED, NOT AS A BASE LINE, BUT
RATHER AS CEILING. THAT IS, IT IS VERY UNLIKELY
THAT A COMPLETE SHELTER NAIVE GROUP, WOULD BEHAVE
NEARLY AS CALMLY AND ASSUREDLY AS THIS GROUP.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 76ML27

AD-613 608

MICHIGAN STATE UNIV EAST LANSING COLL OF COMMUNICATION
ARTS

ARGUMENTATIVE THEMES IN CIVIL DEFENSE: (1) A CONTENT
ANALYSIS OF THE NEW YORK TIMES. (U)

DESCRIPTIVE NOTE: COMMUNICATION RESEARCH REPT.

JUN 64 75P BETTINGHAUS, ERWIN P. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, PUBLIC
OPINION), (*NEWSPAPERS, CIVIL DEFENSE SYSTEMS),
NUCLEAR WARFARE, SHELTERS, COSTS, HISTORY, POLITICAL
SCIENCE, UNITED STATES GOVERNMENT, ATTITUDES,
SURVIVAL, DISARMAMENT (U)

IDENTIFIERS: FALLOUT SHELTERS, NEW YORK TIMES (U)

THE REPORT PROVIDES THE COMMUNICATION RESEARCHER OR
THE PUBLIC AFFAIRS SPECIALIST WITH A CATEGORY SCHEME
FOR DESCRIBING THE MATERIALS TO BE FOUND IN THE CIVIL
DEFENSE FIELD. IT ALSO PROVIDES AN APPENDIX WHICH
ATTEMPTS TO RECONCILE TWO DIVERGENT REPORTS ON CIVIL
DEFENSE MATERIALS. ONE REPORT, ENTITLED
ARGUMENTATIVE THEMES IN CIVIL DEFENSE, IS
COMPARED WITH CIVIL DEFENSE AND SOCIETY BY
JERI NEHNEVAJSA AND HIS COLLEAGUES AT THE
UNIVERSITY OF PITTSBURGH. THE COMPARISON
INDICATES THAT THE TWO REPORTS ARE NOT INCOMPATIBLE,
ALTHOUGH THE CATEGORY SCHEMES USED IN THE TWO SEEM
QUITE DIFFERENT. THE REPORT SUGGESTS THAT THERE ARE
SIXTEEN GENERAL AREAS INTO WHICH CIVIL DEFENSE
MATERIALS CAN BE PLACED. THE CATEGORIES ARE ONLY
RELATIVELY INDEPENDENT, BUT CERTAINLY SERVE TO
DISTINGUISH VARIOUS POSITIONS IN THE CIVIL DEFENSE
DIALOGUE. THE REPORT ALSO OFFERS THE FOLLOWING
TENTATIVE CONCLUSIONS REGARDING THE FREQUENCY OF
MATERIALS APPEARING IN THE NEW YORK TIMES FOR
THE PERIOD CITED: (1) THE GREATEST PERCENTAGE
(39.48) OF ALL ARGUMENTS IDENTIFIED REFERRED TO
FALLOUT SHELTERS; AND (2) THE LARGEST PERCENTAGE
OF ALL STORIES (48.28) WERE FOUND TO BE FAVORABLE
TO OGD POLICIES, AND WHEN THE NEUTRAL ARTICLES ARE
REMOVED FROM CONSIDERATION, THE PERCENTAGE RISES TO
69.98. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-614 824

WESTERN REGIONAL RESEARCH LAB ALBANY CALIF
BULGUR WAFER AND ADJUNCTS FOR FALLOUT SHELTER
RATIONS.

(U)

DESCRIPTIVE NOTE: ANNUAL REPT. FOR JUL 63-JUN 64,
JAN 65 52P SHEPHERD, ALLAN D. ;

BEAVERS, DARRELL V. ; FERREL, ROBERT E. ;

MORVAT, ROBERT J. ; NG, HAWKINS ;

CONTRACT: OCD 0562 54

PROJ: 1300

TASK: 1310

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, RADIOACTIVE FALLOUT), (*FOOD, SHELTERS),
WHEAT, STORAGE, LIFE EXPECTANCY, STABILITY, TASTE,
OXIDATION, DECOMPOSITION, CHEMICAL ANALYSIS, TESTS,
CONDIMENTS, CIVIL DEFENSE SYSTEM

(U)

IDENTIFIERS: BULGUR WAFERS

(U)

LONG-TERM (FIVE-YEAR) STUDIES OF THE STORAGE
LIFE OF BULGUR WAFERS AND ADJUNCTS (FOOD TO SERVE
WITH THE WAFERS TO VARY FALL OUT SHELTER MENUS) ARE
IN PROGRESS. TASTE PANEL RESULTS AFTER 16 MONTHS
OF STORAGE INDICATE THAT THE SHELF-LIFE OF BULGUR
WAFERS MAY BE INCREASED BY NITROGEN-GAS PACKING AND
BY USE OF MALT SIRUP RATHER THAN CORN SIRUP IN THE
FORMULATION. CHEMICAL-PHYSICAL ANALYSES ARE BEING
MADE ON DUPLICATE SAMPLES OF WAFERS IN A SEARCH FOR A
TEST THAT CORRELATES WITH ORGANOLEPTIC EVALUATION.
TRENDS ARE NOT YET WELL ENOUGH DEVELOPED TO PERMIT
MEANINGFUL CORRELATION. IDENTIFY OF COMPONENTS OF
THE VAPORS FROM KANCIDIFYING BULGUR AND FROM A MODEL
COMPOUND, METHYL LINOLEATE (LINOLEIC ACID COMPRISES
MORE THAN HALF OF THE FATTY ACIDS IN WHEAT), IS
BEING SOUGHT BY MEANS OF A NEW TECHNIQUE WHICH
COMBINES GAS-LIQUID CHROMATOGRAPHY AND RAPID-SCAN
MASS SPECTROMETRY. WHEAT PRODUCTS PREPARED BY HOT-
AIR PUFF-DRYING AND BY GUN PUFFING HAVE BEEN
EVALUATED AS WAFER INGREDIENTS POTENTIALLY CHEAPER
THAN REGULAR PUFFED BULGUR. MATERIAL OBTAINED BY
HOT-AIR PUFF-DRYING SHOWS SOME PROMISE AS A SUITABLE
ALTERNATE WHEAT INGREDIENT FOR WAFERS. SEVERAL NEW
ADJUNCTS HAVE BEEN PROPOSED, INCLUDING A PECTIN JELLY
PREPARED WITH COLD WATER TO REPLACE THE ORIGINALLY
DEVELOPED JELLIES REQUIRING HOT WATER FOR
PREPARATION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-614 895

RAND CORP SANTA MONICA CALIF

THE CHINESE NUCLEAR EXPLOSION, N-NATION NUCLEAR
DEVELOPMENT AND CIVIL DEFENSE, (U)

APR 65 26P

ZILBERT, E. R. I

REPT. NO. P-3074

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*NUCLEAR EXPLOSIONS, CHINA), (*CHINA,
NUCLEAR EXPLOSIONS), (*UNITED STATES, CIVIL DEFENSE
SYSTEMS), (*CIVIL DEFENSE SYSTEMS, UNITED STATES),
RADIOACTIVE FALLOUT, NUCLEAR WARFARE, HISTORY,
SHELTERS, INDIA, BRAZIL, CUBA (U)
IDENTIFIERS: FALLOUT SHELTERS (U)

THE OCTOBER 1964 EXPLOSION OF AN ATOMIC DEVICE BY
CHINA IS REVIEWED, WITH THOUGHT AS TO POSSIBLE
SIMILAR ACTIVITIES BY OTHER COUNTRIES SUCH AS INDIA
AND BRAZIL. THE UNITED STATES GOVERNMENT IS
TAKEN TO TASK FOR HAVING IMPLEMENTED NO FALLOUT
SHELTER PROGRAM. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-614 979

NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

DEVELOPMENTS IN PROTECTIVE SHELTER SYSTEMS. (U)

DESCRIPTIVE NOTE: REPT. FOR JUL 62-MAY 64,

APR 65 124P RUSH, P. J. ;

REPT. NO. NCEL-TR-357

PROJ: Y-F011-05-02-303

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, DESIGN), (*CIVIL DEFENSE
SYSTEMS, SHELTERS), BLAST, NUCLEAR EXPLOSIONS, DRAG,
SHOCK (MECHANICS), CRATERING, THERMAL RADIATION,
BIOLOGICAL WARFARE AGENTS, CHEMICAL WARFARE AGENTS,
UNDERGROUND STRUCTURES, SPECIFICATIONS, SOILS,
CONSTRUCTION, OPERATION, MATERIALS, ELECTROMAGNETIC
PULSES, COSTS, AIR, TEMPERATURE CONTROL, HUMIDITY,
WATER SUPPLIES, FOOD, MEDICAL SUPPLIES, SANITARY
ENGINEERING, ILLUMINATION, POWER SUPPLIES,
COMMUNICATION SYSTEMS (U)

TOPICS INCLUDE: BIBLIOGRAPHY OF NUCLEAR WEAPONS
EFFECTS, THE PROTECTIVE STRUCTURE, CONFINING SOILS,
ENTRANCEWAYS AND EXITS, BLAST EXCLUSION METHODS,
SHOCK ISOLATION, NUCLEAR AND THERMAL RADIATION
RESISTANCE, ELECTROMAGNETIC PULSE RESISTANCE,
RESISTANCE TO CHEMICAL AND BACTERIOLOGICAL ATTACK,
SHELTER COSTS, SPACE AND FURNISHING REQUIREMENTS, AIR
SUPPLY, TEMPERATURE AND HUMIDITY CONTROL, WATER AND
FOOD SUPPLIES, MEDICAL SUPPLIES, SANITARY FACILITIES,
ILLUMINATION, ELECTRIC POWER SUPPLY, COMMUNICATIONS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-615 003

GEORGIA UNIV ATHENS

SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA.

(U)

DESCRIPTIVE NOTE: APPENDICES.

DEC 64 149P

TASK: 1521A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO -615 004.

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, SCIENTIFIC RESEARCH), (*MANAGEMENT
ENGINEERING, SHELTERS), CIVIL DEFENSE SYSTEMS,
PERSONNEL MANAGEMENT, PERSONNEL, PERFORMANCE (HUMAN),
CONFINED ENVIRONMENTS, STRESS (PSYCHOLOGY), STRESS
(PHYSIOLOGY), PERSONALITY, LEADERSHIP, SANITARY
ENGINEERING, PHENOLS, SLEEP, TEMPERATURE, FOOD, WATER,
PHYSICAL FITNESS, VENTILATION, LOGISTICS,
ENVIRONMENTAL TESTS

(U)

FROM 8-21 FEBRUARY, 1964, A 13-DAY SIMULATED
FALLOUT SHELTER OCCUPANCY TEST WAS CONDUCTED BY THE
UNIVERSITY OF GEORGIA PSYCHOLOGICAL
LABORATORIES. THIS TEST WAS THE FIFTH IN A
SERIES OF SUCH STUDIES. ITS PRIMARY PURPOSE WAS
THE EVALUATION OF SHELTER SURVIVAL WITHOUT A TRAINED
SHELTER MANAGER. OTHER PURPOSES INCLUDED RELATIVE
FOOD PREFERENCE TESTS, COMMODE CHEMICAL TESTS, AND
COGNITIVE VIGILANCE TESTS. THIRTY SHELTEREES, 15
MALES, 15 FEMALES, AGED 7-70, PARTICIPATED. STRESS
CONDITIONS INCLUDED RESTRICTED FOOD AND WATER
RATIONS, MINIMAL LIVING SPACE (8 SQ. FT./PERSON),
A CHEMICAL COMMODE, REDUCED VENTILATION, AND SLEEPING
ACCOMMODATIONS OF CORRUGATED FIBERBOARD PLACED OVER A
CONCRETE FLOOR. THE SHELTER MANAGER WAS APPOINTED,
ALTHOUGH HE RECEIVED NO PRIOR TRAINING IN MANAGEMENT
METHODS OR FAMILIARIZATION WITH SHELTER MATERIAL. A
SHELTER MANAGER HANDBOOK, WITH ADDITIONAL
INSTRUCTIONAL MATERIAL, WAS STOCKED WITH THE OCD
SHELTER SUPPLIES. THE HANDBOOK PROVIDED
INFORMATION ON USE OF STOCKED ITEMS, AS WELL AS A
SUGGESTED DAILY ACTIVITY AND TRAINING PROGRAM.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-615 005

GEORGIA UNIV ATHENS

SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA.

(U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT.,
DEC 64 20P HAMMES, JOHN A. ;

TASK: 1521A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-615 004.

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, SCIENTIFIC RESEARCH), (*MANAGEMENT
ENGINEERING, SHELTERS), CIVIL DEFENSE SYSTEMS,
PERSONNEL MANAGEMENT, PERSONNEL, PERFORMANCE (HUMAN),
CONFINED ENVIRONMENTS, STRESS (PSYCHOLOGY), STRESS
(PHYSIOLOGY), PERSONALITY, LEADERSHIP, SANITARY
ENGINEERING, PHENOLS, SLEEP, TEMPERATURE, FOOD, WATER,
PHYSICAL FITNESS, VENTILATION, LOGISTICS,
ENVIRONMENTAL TESTS

(U)

SHELTER OCCUPANCY STUDIES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-615 391

IIT RESEARCH INST CHICAGO ILL
SHELTER FIRE VULNERABILITY - SURVEY AND ANALYSIS OF
REPRESENTATIVE BUILDINGS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

MAR 65 101P VARLEY, R. B. IMAATHAN, G. L. :

CONTRACT: OCD 0562 210

PROJ: N6005

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, FIRE SAFETY), (*FIRE SAFETY,
SHELTERS), (*RADIOACTIVE FALLOUT, SHELTERS), FIRE
EXTINGUISHERS, FIRES, VULNERABILITY, NUCLEAR EXPLOSION
DAMAGE, STRUCTURAL PROPERTIES, CIVIL DEFENSE SYSTEMS,
HAZARDS (U)

IDENTIFIERS: FIRE-RESISTANT MATERIALS (U)

THE VULNERABILITY OF FALLOUT SHELTERS TO FIRES FROM
ACCIDENTAL SOURCES AS WELL AS FROM DIRECT NUCLEAR
WEAPON EFFECTS ARE EVALUATED. THIS WAS
ACCOMPLISHED BY SURVEY AND ANALYSIS OF 102 STOCKED
SHELTER BUILDINGS IN ELEVEN CITIES CHOSEN TO GIVE
REASONABLE DIVERSITY IN SIZE, INDUSTRIAL AND
COMMERCIAL EMPHASIS, AND GEOGRAPHIC LOCATION.
OPERATIONAL GUIDANCE DEVELOPED FOR THE SELECTION
AND UPGRADING OF SHELTER BUILDINGS AND RECOMMENDED
FALLOUT SHELTER PROVISIONS FOR PUBLIC BUILDING CODES
ARE ESTABLISHED FOR BOTH EXISTING STRUCTURES AND NEW
CONSTRUCTION. AREAS FOR FUTURE STUDY AND
DEVELOPMENT ARE IDENTIFIED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-615 640

PROTECTIVE STRUCTURES DEVELOPMENT CENTER FORT BELVOIR

VA

EVALUATION OF 200-PERSON SHELTER (VENTILATION). (U)

DESCRIPTIVE NOTE: REPT. FOR 29 SEP-1; OCT 63,

APR 65 52P SVAERI, O. W. ;

REPT. NO. PSDC-TR-6

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SHELTERS, VENTILATION), (RADIOACTIVE
FALLOUT, SHELTERS), CIVIL DEFENSE SYSTEMS, THERMAL
PROPERTIES, TEMPERATURE, HUMIDITY, HEAT TRANSFER (U)

OBSERVATIONS WERE MADE OF THE THERMAL ENVIRONMENT
IN THE BASEMENT PORTION OF A BOX SHAPED REINFORCED
CONCRETE 200 PERSON SHELTER WHEN THE SHELTER WAS
SUPPLIED WITH A MINIMUM QUANTITY OF VENTILATION AIR.
ALSO, AN EVALUATION WAS MADE OF THE DISTRIBUTION OF
THE VENTILATION AIR IN THE SHELTER AS MEASURED BY
VARIATIONS IN EFFECTIVE TEMPERATURE, WHEN THE AIR WAS
SUPPLIED THROUGH A DUCT SYSTEM AND THROUGH A SINGLE
POINT SOURCE. VENTILATION AIR CONDITIONED TO
SIMULATE A 1% DESIGN DAY IN THE WASHINGTON, D.
C. AREA (I.E. AIR AT DRY BULB AND WET BULB
TEMPERATURES WHICH WILL NOT BE EXCEEDED MORE THAN
1% OF THE TIME), WAS SUPPLIED TO THE SHELTER AREA
TESTED. APPROXIMATELY 100 SIMULATED OCCUPANTS WERE
PLACED IN THE SHELTER BASEMENT TO GENERATE THE SAME
AMOUNT OF HEAT AND MOISTURE AS 100 HUMAN OCCUPANTS.
WHEN CONDITIONED AIR WAS SUPPLIED AT A MINIMUM RATE
OF 3 CFM PER PERSON, EFFECTIVE TEMPERATURES AS HIGH
AS 90 DEG WERE ATTAINED AND MAINTAINED WITHIN THE
SHELTER. BASED ON CURRENT STANDARDS FOR THE THERMAL
ENVIRONMENT IN SHELTERS, IT IS CONCLUDED THAT A
MINIMUM VENTILATION RATE OF 3 CFM IS NOT ADEQUATE FOR
COOLING THIS SHELTER SPACE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-615 779

INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND
POLITICAL STUDIES DIV

A DAMAGE-LIMITING SHELTER-ALLOCATION STRATEGY, (U)

APR 65 74P KELLEHER, GRACE J. I

REPT. NO. S-186 ,IDA-HQ-65-3518

CONTRACT: OCD OS63 134

TASK: 4113C

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHELTERS, NUCLEAR EXPLOSION
DAMAGE), (*NUCLEAR EXPLOSION DAMAGE, SHELTERS),
(*CIVIL DEFENSE SYSTEMS, SHELTERS), RADIOACTIVE
FALLOUT, SURVIVAL, NUCLEAR WARFARE CASUALTIES,
NATIONAL DEFENSE, URBAN AREAS, POPULATION,
BLAST, COSTS, MATHEMATICAL MODELS (U)
IDENTIFIERS: FALLOUT SHELTERS, COST-EFFECTIVENESS
ANALYSIS (U)

A DAMAGE-LIMITING STRATEGY FOR ALLOCATING BLAST AND
FALLOUT SHELTER PROTECTION IS PROPOSED. THE
FEATURES WHICH COMBINE TO MAKE THIS STRATEGY UNIQUE
ARE ITS RELATIVELY FINE-GRAINED LOCAL ORIENTATION AND
ITS ABILITY TO MEET A SURVIVAL PERCENTAGE CRITERION
IRRESPECTIVE OF THE ACTUAL GROUND ZERO WITHIN THE
AREA CONSIDERED. THE STRATEGY PROPOSED HERE
TAILORS SHELTER POSTURES TO THE CONDITIONS AND NEEDS
OF INDIVIDUAL CITIES OR LOCAL AREAS. THIS LOCAL
APPROACH COULD BE USED TO DEVELOP A NATIONAL SHELTER
PROGRAM EVALUATING THE NEEDS OF MANY CITIES BY SERIAL
APPLICATION OF THE SHELTER ALLOCATION MODEL.
SHELTER POSTURES PRODUCED UNDER THIS STRATEGY
CONSIDER ALL POTENTIAL GROUND ZEROS WITHIN THE
PROTECTED AREA AS PART OF THE SHELTER ALLOCATION
PROCESS; THUS, FATALITIES FROM IMMEDIATE BLAST
EFFECTS AND FALLOUT ARE LIMITED TO A STIPULATED
LEVEL, IRRESPECTIVE OF WHERE AN ASSUMED WEAPON MIGHT
BE DELIVERED WITHIN A TARGET CITY. COSTS ARE
MINIMIZED IN THE SHELTER ALLOCATION PROCESS BY
FOLLOWING THREE SPECIFIC DECISION RULES DESCRIBED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-617 111

HUDSON INST INC HARMON, ON-HUDSON N Y
AN EVALUATION OF THE SHELTER POTENTIAL IN MINES,
CAVES AND TUNNELS. (U)

DESCRIPTIVE NOTE: FINAL RESEARCH REPT.,
JUN 65 76P KRUPKA, ROBERT A. ;
REPT. NO. HI-507-RR
TASK: 4211B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-617 112.

DESCRIPTORS: (*SHELTERS, UNDERGROUND STRUCTURES),
(*UNDERGROUND STRUCTURES, SHELTERS), FEASIBILITY
STUDIES, COSTS, CIVIL DEFENSE SYSTEMS (U)

THIS STUDY EXAMINES THE AVAILABILITY AND THE
POTENTIAL OF USING MINE SPACE (AND TO A LESSER
EXTENT, CAVE AND TUNNEL SPACE) IN FUTURE CIVIL
DEFENSE PROGRAMS. IT PROVIDES BACKGROUND
INFORMATION CONCERNING PREVIOUS RESEARCH ON THIS
STUDY, AND MAKES NEW ESTIMATES OF USABLE SPACE AND
YEARLY SPACE INCREASES, BASED ON A SAMPLE SURVEY OF A
FEW MINES. THE POSSIBILITIES AND COSTS OF
DEVELOPING NEW MINE SPACE AND ADAPTING MINES TO
SHELTER USE IS ALSO DISCUSSED. INFORMATION ON
CAVES AND TUNNELS IS ALSO INCLUDED. THREE
APPENDICES (AD-617 112) ARE INCLUDED WITH THIS
REPORT, CONTAINING DETAILED LISTING OF MINES AND
CAVES LOCATED BY THE NATIONAL FALLOUT SHELTER
SURVEY, AND DETAILED LISTINGS AND LOCATIONS OF
VEHICULAR TUNNELS. THIS DATA IS INTENDED FOR
POSSIBLE USE BY THOSE WHO MIGHT WISH TO UNDERTAKE
MORE SPECIFIC STUDIES OF SHELTER POTENTIAL IN MINES,
CAVES, AND TUNNELS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-617 112

HUDSON INST INC HARMON-ON-HUDSON N Y
AN EVALUATION OF THE SHELTER POTENTIAL IN MINES,
CAVES AND TUNNELS. APPENDICES I, II, III, (U)
JUN 65 147P KRUPKA, ROBERT A. I
REPT. NO. HI-507-RR/1 2 3
TASK: 4211B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-617 111.

DESCRIPTORS: (*SHELTERS, UNDERGROUND STRUCTURES),
(*UNDERGROUND STRUCTURES, SHELTERS), CIVIL
DEFENSE SYSTEMS, TABLES (U)

DETAILED LISTING OF MINES AND CAVES LOCATED BY THE
NATIONAL FALLOUT SHELTER SURVEY, AND DETAILED
LISTING AND LOCATIONS OF VEHICULAR TUNNELS. THIS
DATA IS INTENDED FOR POSSIBLE USE IN MORE SPECIFIC
STUDIES OF SHELTER POTENTIAL IN MINES, CAVES, AND
TUNNELS. (U)

UNCLASSIFIED

/BML27

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-617 113

HUDSON INST INC HARMON-ON-HUDSON N Y
POPULATION DENSITY IN THE UNITED STATES URBANIZED
AREAS. (U)

DESCRIPTIVE NOTE: FINAL RESEARCH REPT.,
MAR 65 54P BROWN, WILLIAM M. ;
GUTELLE, PAULINE ;
REPT. NO. H1-496-HR
TASK: 4211B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (POPULATION, URBAN AREAS), (URBAN
AREAS, UNITED STATES), (SHELTERS, CIVIL
DEFENSE SYSTEMS), DENSITY, COSTS, TABLES,
MATHEMATICAL MODELS (U)

OPTIMIZING THE DESIGN OF A BLAST SHELTER PROGRAM
BASED ON THE PRINCIPLE OF A BALANCED DEFENSE REQUIRES
A FAIRLY ACCURATE KNOWLEDGE OF THE DISTRIBUTION OF
THE POPULATION DENSITY IN THE URBANIZED AREAS ON A
MICRO-SCALE, USING AREAS AS SMALL AS ONE MILE.
USING THE CENSUS TRACT DATA MADE AVAILABLE BY THE
CENSUS BUREAU AND THE OFFICE OF CIVIL
DEFENSE, THIS PAPER DEVELOPS A MODEL OF THE MICRO-
POPULATION DENSITY DISTRIBUTION THROUGHOUT THE
URBANIZED AREAS OF THE UNITED STATES. OUR
RESULTS ARE BASED ON (1) A DETAILED EXAMINATION
OF THE FIVE LARGEST CENTRAL CITIES, (2) A
COMBINATION OF THE MICRO-EXAMINATION AND STATISTICS
FOR THE OTHER 208 CENTRAL CITIES, AND (3) A
CRUDE SUB-MODEL FOR THE URBAN FRINGE AREAS. THE
MAIN RESULTS OF OUR CALCULATIONS SHOW FIRST THE
NUMBER OF PEOPLE (1960) IN EACH OF THE SELECTED
DENSITY CATEGORIES, AND SECOND, THE NATIONAL COST OF
PROVIDING BLAST SHELTERS FOR THEM CLOSE TO THEIR
RESIDENCES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BHL27

AD-619 518

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
NUCLEAR WEAPONS AND PROTECTION FROM THEM, (U)

MAY 64 52P VLASOV, I. I

REPT. NO. FTD-MT-64-191

MONITOR: TT , 65-63114

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF HONG.
YADERNOE ORUZHIE I ZASHCHITA OT NEGO, MOSCOW 1963
P1-49.

DESCRIPTORS: (*NUCLEAR WEAPONS, CIVIL DEFENSE
SYSTEMS), (*CIVIL DEFENSE SYSTEMS, NUCLEAR
WEAPONS), NUCLEAR BOMBS, NUCLEAR WARFARE,
NUCLEAR EXPLOSIONS, NUCLEAR EXPLOSION DAMAGE,
SHOCK WAVES, RADIATION HAZARDS, RADIOACTIVITY,
UNDERGROUND STRUCTURES, SHELTERS, PROTECTIVE
MASKS, POPULATION, USSR (U)

IDENTIFIERS: FALLOUT SHELTERS (U)

CONTENTS: GENERAL CHARACTERISTICS OF NUCLEAR
WEAPONS; CHARACTERISTICS OF A NUCLEAR EXPLOSION;
APPLICATIONS OF NUCLEAR WEAPONS; DESTRUCTIVE
EFFECT OF NUCLEAR WEAPONS; SHOCK WAVE; LIGHT
RADIATION; PENETRATING RADIATION; RADIOACTIVE
CONTAMINATION OF SITE; BRIEF CHARACTERISTICS OF A
NUCLEAR STRIKEN AREA; THE MAIN PRINCIPLES OF
ORGANIZING PROTECTION FROM NUCLEAR WEAPONS; MEANS
AND METHODS OF PROTECTION FROM NUCLEAR WEAPONS;
COLLECTIVE MEANS OF PROTECTION; INDIVIDUAL MEANS
OF PROTECTION; MAIN OBLIGATIONS AND RULES FOR THE
BEHAVIOR OF THE POPULATION UNDER NUCLEAR ATTACK. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-670 893

DIKEWOOD CORP ALBUQUERQUE N MEX
VULNERABILITY REDUCTION USING MOVEMENT AND
SHELTER.

(U)

DESCRIPTIVE NOTE: SUMMARY REPT., VOL. 1,
JUN 65 11P BRANNON, D. E. ; FLANAGAN, R. J.
; DIKE, S. H. ; GRANZOW, K. D. ; DURAND, A. R. ;
REPT. NO. DC-FR-1039 V.1
CONTRACT: OCD 0563 109

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, NUCLEAR
WARFARE), (*NUCLEAR WARFARE, CIVIL DEFENSE
SYSTEMS), (*SHELTERS, CIVIL DEFENSE SYSTEMS),
(*URBAN PLANNING, CIVIL DEFENSE SYSTEMS), NUCLEAR
WARFARE CASUALTIES, REDUCTION, PROTECTIVE
COVERINGS, SITE SELECTION, POPULATION,
SCHEDULING, OPTIMIZATION, MATHEMATICAL MODELS,
PROGRAMMING (COMPUTERS)

(U)

THIS REPORT DESCRIBES AN EFFORT TO FIND PREFERRED
MIXTURES OF MOVEMENT AND SHELTER AS CIVIL DEFENSE
RESPONSES TO THE THREAT OF NUCLEAR WAR.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-620 894

DIKEWOOD CORP ALBUQUERQUE N MEX
VULNERABILITY REDUCTION USING MOVEMENT AND
SHELTER.

(U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 2:

JUN 65 143P FLANAGAN, R. J. BRANNON, D.
E. DIKE, S. H. GRANZOW, K. D. DURAND, A. R. ;

REPT. NO. DC-FR-1039 V. 2

CONTRACT: OCD 0563 109

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-620 893.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, NUCLEAR
WARFARE), (*NUCLEAR WARFARE, CIVIL DEFENSE
SYSTEMS), (*SHELTERS, CIVIL DEFENSE SYSTEMS),
(*URBAN PLANNING, CIVIL DEFENSE SYSTEMS), NUCLEAR
WARFARE CASUALTIES, REDUCTION, PROTECTIVE
COVERINGS, SITE SELECTION, TRANSPORTATION,
POPULATION, SCHEDULING, MATHEMATICAL MODELS,
PROGRAMMING(COMPUTERS)

(U)

THIS REPORT DESCRIBES AN EFFORT TO FIND PREFERRED
MIXTURES OF MOVEMENT AND SHELTER AS CIVIL DEFENSE
RESPONSES TO THE THREAT OF NUCLEAR WAR. TWO
APPROACHES WERE FOLLOWED: (1) MIXTURES OF
MOVEMENT AND SHELTER WERE STUDIED IN THREE STEPS.
THESE CONSISTED OF: POSTULATION OF ALTERNATIVE
MOVEMENT AND SHELTER POLICIES, DEVELOPMENT OF
MOVEMENT AND SHELTER PLANS BASED ON THESE POLICIES,
EVALUATION OF PLANS DEVELOPED IN (B) AGAINST
THE RANGE OF ATTACK CONDITIONS CONSIDERED REASONABLE.
(2) A MATHEMATICAL MODEL WAS CONSTRUCTED TO
PROVIDE A VEHICLE FOR SENSITIVITY ANALYSES. A
TECHNIQUE FOR PLANNING LARGE-SCALE STRATEGIC
MOVEMENTS WAS DEVELOPED AND APPLIED TO SEVERAL
PARTICULAR PLACES. THE TECHNIQUE IS BELIEVED TO BE
DEVELOPED SUFFICIENTLY TO PROVIDE A BASIS FOR
PLANNING A FIRST-GENERATION STRATEGIC MOVEMENT
CAPABILITY FOR THE U. S. TWO COMPUTER PROGRAMS
WERE DEVELOPED AS TOOLS FOR EVALUATING STRATEGIC
MOVEMENT AGAINST PARTICULAR ATTACKS AND FOR
EVALUATING VARIOUS TRANS-ATTACK RESPONSES TO LARGE-
SCALE MOVEMENTS INTERRUPTED BY WAR. BLAST SHELTER
PLANNING PROGRAMS ARE ALSO REVIEWED AND DEVELOPED
FURTHER. EVALUATION TECHNIQUES ARE ALREADY
AVAILABLE. THE MATHEMATICAL MODEL APPROACH ENDED
WITH THE DEVELOPMENT OF A COMPUTER PROGRAM FOR
FINDING THE SHELTER LOCATION AND HARDNESS REQUIRED TO
MAXIMIZE OVERALL SURVIVAL PROBABILITY.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-621 998

MONTANA STATE UNIV BOZEMAN DEPT OF MECHANICAL
ENGINEERING
VENTILATION OF FALLOUT SHELTERS BY INDUCED
DRAFT.

(U)

DESCRIPTIVE NOTE: REPT. FOR 1 JUL 64-30 JUN 65,
JUN 65 148P WHITEHILL, C. F. MULLIKIN, H.
F. KUBAL, O. A. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, VENTILATION), (*VENTILATION,
SHELTERS), (*CIVIL DEFENSE SYSTEMS, SHELTERS),
GAS FLOW, EXHAUST GASES, COMBUSTION PRODUCTS,
DUCTS, HEALTH PHYSICS, THERMODYNAMICS

(U)

OCCUPANTS OF FAMILY-TYPE FALLOUT SHELTERS REQUIRE FRESH VENTILATION AIR AT THE MINIMUM SURVIVAL RATE OF 3 CFM PER PERSON, BECAUSE COST LIMITATIONS EXCLUDE THE USE OF AUXILIARY POWER PLANTS (DIESEL OR GASOLINE ENGINES) TO OPERATE VENTILATING FANS OR BLOWERS, AN INEXPENSIVE, SIMPLE, AND EFFECTIVE METHOD OF SUPPLYING FRESH AIR TO HOME SHELTERS IS NEEDED. IT IS DEMONSTRATED THAT A MINIMUM AIR RATE CAN BE OBTAINED IN HOME SHELTERS BY INDUCING DRAFT IN THE EXHAUST STACK BY MEANS OF A FLAME FROM A KEROSENE BURNER WHICH CAN SIMULTANEOUSLY PROVIDE ILLUMINATION. THE VENTILATION TEST PROCEDURE INCLUDED INDUCING AIR TO FLOW THROUGH THE SHELTER, DETERMINING THE ACTUAL CUBIC FEET PER MINUTE OF AIR FLOWING, MEASURING AIR TEMPERATURES AT INLET, ROOM, AND STACK, MEASURING THE PRESSURE DROP OR RESTRICTION TO AIR FLOW AT THE SHELTER INLET, AND FINDING THE EFFECTS OF VARIOUS STACK SIZES AND CONFIGURATIONS UPON AIR FLOW RATES. DATA WERE ALSO TAKEN TO DETERMINE THE EFFECT OF VARIOUS STACK SIZES AND CONFIGURATIONS ON THE FUEL CONSUMPTION OF THE HEATING DEVICES. VENTILATION OF FAMILY-TYPE SHELTERS BY THE INDUCED DRAFT METHOD IS EFFECTIVE AND RELIABLE IF THE FOLLOWING CONDITIONS ARE OBSERVED: (1) WIND VELOCITIES AROUND THE STACK OUTLET ARE KEPT TO A MINIMUM OR A GOOD VENTILATOR STACK CAP IS USED; (2) FILTERS ARE NOT USED AT THE SHELTER INLET (AIR TAKEN FROM BODY OF HOUSE); AND (3) THE INTAKE AREA OF SHELTER IS MUCH LARGER THAN THE CROSS-SECTIONAL AREA OF THE STACK. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BHL27

AD-623 464

HRB-SINGER INC STATE COLLEGE PA
PSYCHO-SOCIAL PROBLEMS OF SHELTER OCCUPANCY.
DESCRIPTIVE NOTE: FINAL REPT. (U)

JUL 65 245P WRIGHT, GRACE M. ;
HAMBACHER, WILLIAM O. ;
REPT. NO. HRB-751.11-F
CONTRACT: OCD 0565 S
PROJ: OCD-1500
TASK: 1510

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, SOCIAL PSYCHOLOGY),
(*SOCIAL PSYCHOLOGY, SHELTERS),
STRESS(PSYCHOLOGY), CIVIL DEFENSE SYSTEMS,
PROJECTIVE TECHNIQUES, BEHAVIOR,
ADJUSTMENT(PSYCHOLOGY) (U)

IDENTIFIERS: CROWDING(PEOPLE), ENVIRONMENT (U)

THE PROJECT DEVELOPED A PSYCHOLOGICAL MODEL OF PROTECTIVE SHELTERS AND A METHODOLOGY FOR IDENTIFYING AND DESCRIBING THE PSYCHOLOGICAL STRESSES AND SUPPORTS EXISTING DURING ENSHELTERMENT. THE ADMISSION WARDS OF SELECTED PSYCHIATRIC HOSPITALS WERE USED AS AN ANALOGUE TO THE SHELTER CONFINEMENT WITH SUBJECTS RIGOROUSLY SELECTED TO INSURE VALID EXTRAPOLATION OF RESULTS TO THE PROJECTED SHELTER OCCUPANCY POPULATION. EMPHASIS WAS PLACED UPON STUDYING THE PSYCHOLOGICAL RATHER THAN THE PHYSICAL ENVIRONMENT. THE APPROACH UTILIZED A LITERATURE COLLATION COVERING THE CLINICAL AS WELL AS THE TRADITIONAL STRESS RESEARCH IN ORDER TO DEFINE AND DESCRIBE THE PSYCHOLOGICAL PROCESSES OCCURRING WITHIN THE SHELTER. SELECTED PROJECTIVE TECHNIQUES, A WARD BEHAVIOR RATING FORM, AND AN IN-HOUSE DEVELOPED SELF-RATING FORM PROVIDED DATA FOR ORDERING THE PSYCHOLOGICAL PROCESSES UNDER INVESTIGATION IN TERMS OF PROBABILITY OF OCCURRENCE AND IMPORTANCE OF RESULTING BEHAVIOR. THESE DATA ALSO PROVIDED A BASE FOR VALIDATING COMPARISONS WITH DATA FROM EXISTING OCCUPANCY STUDIES. A SET OF DIAGNOSTIC TOOLS WAS DEVELOPED FOR USE BY THE SHELTER MANAGER. A TWO-MAN GAME WAS CONSTRUCTED AND PRETESTED AS A SCREENING DEVICE FOR SHELTER MANAGER USE. A SET OF PROBABLE BEHAVIORS RELATED TO THE RESULTS OBTAINED FROM THE ABOVE WERE PROVIDED AS WELL AS A SET OF REMEDIAL ACTIONS TO BE TAKEN BY THE SHELTER MANAGER. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-623 578

PUBLIC HEALTH SERVICE WASHINGTON D C DIV OF HEALTH
MOBILIZATION
HEAT SYNDROME DATA FROM SELECTED HOSPITAL RECORD
SURVEY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

65 89P

CONTRACT: OCD OS62 100

TASK: 1221A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (HEAT TOLERANCE, STATISTICAL
ANALYSIS), AGING(PHYSIOLOGY), CARDIOVASCULAR
SYSTEM, CIVIL DEFENSE SYSTEMS, CLIMATOLOGY,
DISASTERS, EPIDEMIOLOGY, HOSPITALS, HUMIDITY,
LOUISIANA, MEDICAL PERSONNEL, SHELTERS,
STRESS(PHYSIOLOGY), SURVIVAL

(U)

STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES, BOTH
ENVIRONMENTAL AND HUMAN FACTORS, WITH PREVENTIVE AND
ALLEVIATING SUGGESTIONS FOR CIVIL DEFENSE SHELTERS
AND SIMILAR SITUATIONS. USEFUL BASE FOR CLINICAL
EVALUATION, FOR PHYSICIANS AND OTHER MEDICAL
PERSONNEL IN EMERGENCY SITUATIONS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BNL27

AD-624 370 13/13 15/3 18/5
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA WEAPONS
SYSTEMS EVALUATION DIV
MAGNITUDE AND DISTRIBUTION OF WEAPON EFFECTS FOR THE
DESIGN OF SHELTERS FOR PROTECTION AGAINST
FALLOUT. (U)

DESCRIPTIVE NOTE: RESEARCH PAPER,
JUL 65 98P KNAPP, H. A. I
REPT. NO. RP-P-194

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, DESIGN),
(*NUCLEAR EXPLOSION DAMAGE, ANALYSIS),
(*NUCLEAR WEAPONS, RADIATION EFFECTS),
(*RADIATION EFFECTS, ANALYSIS), CIVIL DEFENSE
SYSTEMS, NUCLEAR WARFARE CASUALTIES, POPULATION,
DISTRIBUTION, TARGETS (U)

IN ORDER TO DESIGN A FALLOUT SHELTER WHICH OFFERS A
REASONABLE PROSPECT OF OCCUPANT SURVIVAL, A
QUANTITATIVE ESTIMATE WAS MADE OF THE LEVELS OF
BLAST, THERMAL PULSE, INITIAL RADIATION, AND FALLOUT
TO WHICH THE SHELTER LOCATION MIGHT BE SUBJECTED. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-524 701 15/3 14/1 12/2 18/3
RESEARCH TRIANGLE INST DURHAM N C OPERATIONS RESEARCH AND
ECONOMICS DIV
SENSITIVITY ANALYSIS OF CIVIL DEFENSE SYSTEMS AND
COMPONENTS. A COST-EFFECTIVENESS COMPUTER PROCEDURE
FOR OPTIMUM ALLOCATION OF FALLOUT SHELTER SYSTEM FUND
UNDER UNIFORM OR VARIABLE RISK ASSUMPTIONS. (U)
DESCRIPTIVE NOTE: FINAL REPT., VOL. 1,
OCT 65 88P GUESS, FLOYD M. ;
REPT. NO. R-OU-157
TASK: 4113E

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEM, RADIOACTIVE
FALLOUT), (*FALLOUT SHELTERS, COST
EFFECTIVENESS), (*COST EFFECTIVENESS, FALLOUT
SHELTERS), MATHEMATICAL MODELS,
PROGRAMMING (COMPUTERS), FEDERAL BUDGETS,
RADIOLOGICAL DOSAGE, NUCLEAR WARFARE, OPERATIONS
RESEARCH, STATISTICAL ANALYSIS (U)

THE DYNAMICS OF CIVIL DEFENSE PLANNING AND SYSTEMS
EVALUATION REQUIRE A PROCEDURE THAT YIELDS
APPROXIMATE ANSWERS TO QUESTIONS CONCERNING EFFECTIVE
FALLOUT SHELTER IMPROVEMENT PROGRAMS. TO
ACCOMPLISH THIS, A COMPUTERIZED MODEL FOR THE CDC
3600 IS DEVELOPED AND DEMONSTRATED FOR OCD REGION
6. THE MODEL PERMITS AN EVALUATION OF SHELTER
IMPROVEMENT PROGRAMS AGAINST ANY FALLOUT ENVIRONMENT.
BUT IT IS PARTICULARLY VALUABLE WHEN RISK-TYPE
EXPRESSIONS OF THE PROBABLE FALLOUT ENVIRONMENT ARE
USED AS INPUTS. USING DETAILED DATA FROM THE
NATIONAL FALLOUT SHELTER SURVEY AND EQUALLY
DETAILED ESTIMATES OF THE PROBABLE FALLOUT HAZARD IN
A SMALL AREA (COUNTIES, IN THE DEMONSTRATION),
THE EXTENT TO WHICH AN AREA'S POPULATION IS
INADEQUATELY PROTECTED IS DETERMINED. FALLOUT
SHELTER SYSTEM FUNDS ARE THEN ALLOCATED TO AREAS OF
NEED IN AN OPTIMAL MANNER. THE ALLOCATION EMPLOYS
SHELTER COST DATA OBTAINED FROM PHASE 2 OF THE
NATIONAL FALLOUT SHELTER SURVEY ON
VENTILATION AND SHIELDING IMPROVEMENTS. ESTIMATED
COSTS FOR PACKAGE VENTILATION (PKV) AND SHELTER IN
NEW CONSTRUCTION ARE ALSO EMPLOYED IN THE
DEMONSTRATION IN OCD REGION 6. IN ALL, 14 COST
STUDIES ARE RUN, USING SELECTED COMBINATIONS OF THE
BUDGET LEVEL, THE FALLOUT RISK LEVEL, ETC. (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-624 702 15/3 14/1 12/2 18/3
RESEARCH TRIANGLE INST DURHAM N C OPERATIONS RESEARCH AND
ECONOMICS DIV
A SENSITIVITY ANALYSIS OF SELECTED PARAMETERS BASED
ON 8 SMSA'S. (U)
DESCRIPTIVE NOTE: FINAL REPT., VOL. 2,
OCT 65 74P SINK, H. RODNEY ;
REPT. NO. R-OU-157
PROJ: RTI-OU-157
TASK: 4113E

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, RADIOACTIVE
FALLOUT), (*FALLOUT SHELTERS, CIVIL DEFENSE
SYSTEMS), (*OPERATIONS RESEARCH, CIVIL DEFENSE
SYSTEMS), MATHEMATICAL MODELS,
PROGRAMMING (COMPUTERS), FEDERAL BUDGETS,
RADIOLOGICAL DOSAGE, NUCLEAR WARFARE, COST
EFFECTIVENESS, STATISTICAL ANALYSIS (U)

IN ORDER TO PERFORM A SENSITIVITY ANALYSIS OF
SELECTED PARAMETERS OF INTEREST IN CIVIL DEFENSE
SYSTEMS ANALYSIS, PROBABLE CASUALTIES ARE ESTIMATED
FOR 8 SMSA'S OVER A RANGE OF FALLOUT ENVIRONMENTS
AND SHELTER UTILIZATION PATTERNS. THE SELECTED
PARAMETERS ARE: SMSA POPULATION, POPULATION
DENSITY, AND RATIO OF SHELTER SPACES TO POPULATION;
FALLOUT ARRIVAL TIME AND REFERENCE INTENSITY; AND
RESTRICTIONS ON MOVEMENT OF PEOPLE TO SHELTER,
LEADING TO VARYING PATTERNS OF SHELTER UTILIZATION.
THE SMSA'S ARE SELECTED BY JUDGMENT SAMPLING
AND RANGE IN POPULATION FROM 74,000 TO 408,000.
THE FALLOUT ENVIRONMENTS USED RANGE FROM A
REFERENCE INTENSITY OF 600 R/HR AND 7 HOURS TIME OF
ARRIVAL TO A REFERENCE INTENSITY OF 30,000 R/HR AND 1
HOUR TIME OF ARRIVAL. THE MOVEMENT-TO-SHELTER
RESTRICTIONS ARE: (1) MOVEMENT RESTRICTED TO THE
STANDARD LOCATION (SL) OF RESIDENCE, (2)
MOVEMENT RESTRICTED TO WITHIN TWO MILES OF THE SL
OF RESIDENCE, AND (3) UNRESTRICTED MOVEMENT TO
SHELTER ANYWHERE WITHIN THE SMSA. ALSO, (4)
THE TRANSPORTATION ALGORITHM IS USED TO DETERMINE THE
OPTIMAL (MINIMUM CASUALTY) ALLOCATION OF PEOPLE
TO SHELTER FOR EACH TIME OF ARRIVAL AND REFERENCE
INTENSITY COMBINATION. THIS ALLOCATION SERVES AS A
BENCHMARK OF IDEALITY AGAINST WHICH TO MEASURE OTHER
PATTERNS OF SHELTER UTILIZATION. CASUALTIES ARE
COMPUTED FOR EACH OF THE FOUR MOVEMENT PATTERNS OVER
THE RANGE OF ATTACK ENVIRONMENTS. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-624 704 15/3 14/1 12/2 18/3
RESEARCH TRIANGLE INST DURHAM N C OPERATIONS RESEARCH AND
ECONOMICS DIV
SENSITIVITY ANALYSIS OF CIVIL DEFENSE SYSTEMS AND
COMPONENTS. INTRODUCTION AND SUMMARY. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
OCT 65 26P NEBLETT, JOHN H. IGUESS, FLOYD
M. ; SINK, H. RODNEY ; WILLIS, K. E. ;
REPT. NO. R-OU-157
TASK: OCD-4113E

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (CIVIL DEFENSE SYSTEM, RADIOACTIVE
FALLOUT), (OPERATIONS RESEARCH, CIVIL DEFENSE
SYSTEM), (FALLOUT SHELTERS, CIVIL DEFENSE
SYSTEMS), COST EFFECTIVENESS, FALLOUT SHELTERS,
FEDERAL BUDGETS, MATHEMATICAL MODELS,
PROGRAMMING (COMPUTERS), RADIOLOGICAL DOSAGE,
NUCLEAR WARFARE, NUCLEAR WARFARE CASUALTIES,
STATISTICAL ANALYSIS (U)

THE DOCUMENT SUMMARIZES A THREE PART STUDY
CONCERNING SENSITIVITY ANALYSIS OF CD SYSTEMS AND
COMPONENTS IN A FALLOUT ENVIRONMENT. IN THE FIRST,
A COST/EFFECTIVENESS COMPUTER PROGRAM IS DEVELOPED
FOR OPTIMUM ALLOCATION OF FALLOUT SHELTER SYSTEM
DEVELOPMENT FUNDS UNDER UNIFORM OR VARIABLE RISK
ASSUMPTIONS. THIS PROGRAM, INTENDED FOR USE IN
OCD PLANNING STUDIES, IS PROGRAMMED FOR THE CDC
J600. IT IS APPLIED IN EXAMPLE STUDIES USING DATA
ON OCD REGION 6. THE SECOND PART OF THE STUDY IS
A SENSITIVITY ANALYSIS OF SELECTED PARAMETERS BASED
ON 8 SMSAs. IT EMPLOYS THE TRANSPORTATION
ALGORITHM IN A STUDY OF MOVEMENT OF PEOPLE TO FALLOUT
SHELTERS. THE RESULTS SHOW HOW ESTIMATED
CASUALTIES VARY AS MOVEMENT-TO-SHELTER PATTERNS VARY
FROM RESTRICTION TO A STANDARD LOCATION UP TO FREE
MOVEMENT WITHIN THE SMSA. THEY ALSO INDICATE THAT
DETAILED PLANNING FOR SHELTER UTILIZATION CAN BE VERY
EFFECTIVE IN REDUCING EXPECTED FALLOUT CASUALTIES
WHEN THE NUMBER OF SHELTER SPACES EXCEEDS THE
POPULATION OF AN SMSA. IN THE THIRD PART OF THE
STUDY, A GENERALIZED SENSITIVITY ANALYSIS IS MADE OF
THE PARAMETERS USED IN FALLOUT VULNERABILITY ANALYSIS
MODELS WHICH DETERMINE TOTAL DOSE AND EQUIVALENT
RESIDUAL DOSE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-625 402 13/13 13/11 15/3
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
COLLECTIVE PROTECTOR DESIGN AND DEVELOPMENT. (U)
DESCRIPTIVE NOTE: TECHNICAL NOTE.
NOV 65 22P OLDSON, N. P. IZABLODIL, R. J. &
REPT. NO. NCEL-TN-783
PROJ: Y-F011-08-03-326

UNCLASSIFIED REPORT

DESCRIPTORS: (AIR INTAKE FILTERS, SHELTERS),
VENTILATION, RADIOLOGICAL CONTAMINATION,
BIOLOGICAL WARFARE AGENTS, CHEMICAL WARFARE
AGENTS, CHARCOAL, PAPER, GASES, ABSORPTION,
FIRE-RESISTANT MATERIALS, BLOWERS, AIRBURST,
FEASIBILITY STUDIES, CIVIL DEFENSE SYSTEMS (U)

FILTRATION OF VENTILATION AIR IS NECESSARY TO
PROTECT PERSONNEL IN A SHELTER AREA AGAINST
RADIOLOGICAL, BIOLOGICAL, AND CHEMICAL WARFARE
AGENTS. A "COLLECTIVE PROTECTOR" UNIT INCLUDES
THREE FILTERS, IN SERIES WITH A BLOWER, WHICH WILL
REMOVE CONTAMINATION FROM THE VENTILATING AIR
ENTERING THE SHELTER. THE OBJECTIVE OF THIS WORK
UNIT IS TO DEVELOP A FAMILY OF MODERN, LIGHTWEIGHT
COLLECTIVE PROTECTOR UNITS, WHICH WILL INCORPORATE
EASY REPLACEMENT OF FILTER ELEMENTS, AND EASY
INTERCHANGE OF POWER UNITS. IN THIS CONNECTION
VARIOUS FILTERING MEDIA WERE TO BE INVESTIGATED TO
DETERMINE THE FEASIBILITY OF USING SOME OF THE NEW
CONCEPTS OF AIR FILTERING. THE RESULTS OF THE
STUDY OF FILTERING MEDIA WERE REPORTED IN REFERENCE
2. ACTIVATED CHARCOAL AND PLEATED PAPER WERE
DETERMINED TO BE THE MOST FEASIBLE AND ECONOMICAL
MEDIA FOR REMOVAL OF GAS AND PARTICULATE MATTER
RESPECTIVELY. THE M9A1 COLLECTIVE PROTECTOR
(PRESENTLY USED) WEIGHS 637 POUNDS. THE
CHARCOAL FILTER, FAN ASSEMBLY, SKIDS AND SUPPORTS,
AND INLET PLENUM, WERE SELECTED AS AREAS WHERE
SUBSTANTIAL WEIGHT REDUCTION COULD BE REALIZED. A
CHARCOAL FILTER WEIGHING 185 POUNDS (AS COMPARED TO
218 POUNDS FOR M9A1) WAS DEVELOPED, AND WILL BE
TESTED FOR GAS ABSORPTION AND FIRE RESISTANCE.
PREFILTER AND PARTICULATE FILTER ELEMENTS WERE
SUBJECTED TO LOW PLAST OVERPRESSURES. WITH
REINFORCEMENT THE LIMIT OF OVER-PRESSURE FOR THE
PREFILTERS WAS DETERMINED TO BE 2.8 PSI. THE
BLOWER DRIVE WAS ARRANGED TO ENABLE THE ELECTRIC
MOTOR TO BE REPLACED WITH A GASOLINE ENGINE, AND A
DAMPER FOR CLOSE CONTROL OF AIRFLOW HAS BEEN
DEVELOPED.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-625 436 13/1 13/13
STANFORD RESEARCH INST MENLO PARK CALIF
THE STUDY AND EVALUATION OF ABSORPTION-BASED COOLING
SYSTEMS FOR USE IN CIVIL DEFENSE SHELTERS. (U)
DESCRIPTIVE NOTE: FINAL REPT., 1 JUL 64-31 JUL 65,
DEC 65 87P AMBROSE, J. E.; CONNERFORD, G.
E. ;
PROJ: 1400 ,SWRI-01-1580
TASK: 1420

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, COOLING +
VENTILATING EQUIPMENT), (*COOLING + VENTILATING
EQUIPMENT, FALLOUT SHELTERS), CIVIL DEFENSE
SYSTEMS, ABSORPTION, EFFECTIVENESS, COSTS,
WEIGHT, FURNACES, FUELS, CONFINED
ENVIRONMENTS (U)

A STUDY HAS BEEN MADE OF VARIOUS ABSORPTION CYCLE
COOLING UNITS AND ASSOCIATED COMPONENTS WHICH WOULD
BE REQUIRED TO MAINTAIN A HABITABLE ATMOSPHERE IN
CERTAIN IDENTIFIED CIVIL DEFENSE FALL-OUT SHELTERS.
INDEPENDENT OF ANY EXTERNAL ENERGY SOURCES. OF THE
MANY CRITERIA WHICH COULD BE APPLIED TO THESE
SYSTEMS, FOUR WERE SELECTED AS THE BASES FOR THE
FINAL EVALUATION: E.E., COST, ELECTRICAL REQUIREMENT,
VOLUME AND WEIGHT. THE SELECTED SYSTEM CONSISTS OF
THE AQUEOUS AMMONIA ABSORPTION CYCLE COOLING UNIT
WITH HEAT REJECTION DIRECTLY TO AMBIENT AIR FROM
FINNED-TUBE CONDENSER AND ABSORBER. THIS UNIT
PRODUCES CHILLED WATER WHICH IS CIRCULATED THROUGH A
FINNED-TUBE CONDITIONING COIL WITHIN THE SHELTER
AREA. SHELTER HEAT IS TRANSFERRED TO THE CHILLED
WATER BY BLOWING SHELTER AIR AND VENTILATION AIR
THROUGH THE CONDITIONING COIL. HEAT TO OPERATE THE
ABSORPTION UNIT IS SUPPLIED BY COMBUSTION GASES FROM
A FURNACE DESIGNED TO BURN A VOLATILE-PRODUCING FUEL
WITH COAL AS THE PREFERRED FUEL. MANUAL POWER IS
APPLIED TO PUMP THE CHILLED WATER AND TO CIRCULATE
SHELTER AIR AND COOLING AIR. A SUITABLY DESIGNED
FURNACE NEEDS TO BE DEVELOPED, AND THE NORMALLY GAS-
FIRED ABSORPTION UNIT MUST BE ADAPTED TO THE FURNACE.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-626 984 6/8 15/3
WESTERN REGIONAL RESEARCH LAB ALBANY CALIF
BULGUR WAFER AND ADJUNCTS FOR FALLOUT SHELTER
RATIONS. (U)
DESCRIPTIVE NOTE: ANNUAL REPT., 1 JUL 64-30 JUN 65,
NOV 65 48P SHEPHERD, ALLAN D. ;
FERREL, ROBERT E. ; HORVAT, ROBERT J. ;
NG, HAWKINS ; LANE, WILLIAM G. ;
CONTRACT: OCD-05-62-54
PROJ: OCD-1300
TASK: 1310

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, FOOD), (*FOOD,
STORAGE), WHEAT, LINOLEIC ACID, OXIDATION,
TASTE, TESTS, ODORS, STABILITY, VAPORS,
CHROMATOGRAPHIC ANALYSIS, MASS SPECTROSCOPY,
PREPARATION, DEGRADATION, PACKAGING, CIVIL
DEFENSE SYSTEMS (U)
IDENTIFIERS: ORGANOLEPTIC TESTS (U)

VAPORS FROM RANCIDIFYING BULGUR AND FROM
AUTOXIDIZED METHYL LINOLEATE, A MODEL COMPOUND, ARE
BEING ANALYZED AND IDENTIFIED BY GAS LIQUID
CHROMATOGRAPHY AND MASS SPECTROMETRY. THIRTY-ONE
COMPOUNDS HAVE NOW BEEN TENTATIVELY IDENTIFIED IN
STUDIES ON THE MODEL SYSTEM. THE PRESENCE OF SOME
OF THESE COMPOUNDS IN VAPORS FROM RANCID BULGUR HAS
BEEN VERIFIED. WE HAVE MADE FURTHER STUDY OF GUN-
PUFFING AND HOT-AIR PUFF-DRYING AS ALTERNATE MEANS OF
PREPARING WHEAT INGREDIENTS FOR THE WAFER.
DEVELOPMENT OF A JELLY THAT SETS WITH COLD WATER
ESSENTIALLY CONCLUDES DEVELOPMENT WORK ON ADJUNCTS.
LONG-TERM (FIVE-YEAR) STORAGE STUDIES OF BULGUR
WAFERS AND ADJUNCTS ARE CONTINUING. TASTE PANEL
EVALUATIONS TO DATE INDICATE THAT SHELF LIFE OF BOTH
TYPES OF PRODUCTS CAN BE EXTENDED WITH NITROGEN-
PACKAGING. THE USE OF MALT INSTEAD OF CORN SYRUP
IN WAFER FORMULATION AND OF IN-PACKAGE DESICCANTS
WITH ADJUNCTS ALSO EXTENDS SHELF LIFE. CHEMICAL-
PHYSICAL MEASUREMENTS OF CHANGES TAKING PLACE ARE
BEING MADE ON DUPLICATES OF THE SAMPLES EVALUATED BY
THE TASTE PANEL TO FIND A TEST THAT WILL CORRELATE
WITH ORGANOLEPTIC EVALUATIONS, BUT AS YET NO
MEANINGFUL CORRELATIONS HAVE BEEN FOUND.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 633 13/1 15/3 13/13
GENERAL AMERICAN RESEARCH DIV GENERAL AMERICAN
TRANSPORTATION CORP NILES ILL
SHELTER PACKAGE VENTILATION KIT. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
OCT 65 111P LIBOVICZ, BASIL A. ;
BEHLS, HERMAN F. ;
REPT. NO. GARD-1244,
PROJ: 1423A,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, VENTILATION),
(*VENTILATION, FALLOUT SHELTERS), PORTABLE,
VENTILATION FANS, VENTILATION DUCTS, PLASTICS,
CIVIL DEFENSE SYSTEM, MECHANICAL DRAWINGS,
PERFORMANCE(ENGINEERING, (U)

A PORTABLE VENTILATION SYSTEM THAT CAN BE DRIVEN
MANUALLY OR BY AN ELECTRIC MOTOR WAS DEVELOPED FOR
USE IN CIVIL DEFENSE FALLOUT SHELTERS. THIS
PACKAGE VENTILATION KIT INCLUDES A FAN
ASSEMBLY AND DRIVE MODULES WHICH CAN BE
ASSEMBLED AND OPERATED BY UNTRAINED PERSONNEL.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 634 13/1 13/13 15/3
GENERAL AMERICAN RESEARCH DIV GENERAL AMERICAN
TRANSPORTATION CORP NILES ILL
SHELTER PACKAGE VENTILATION KIT. (U)
DESCRIPTIVE NOTE: SUMMARY RESEARCH REPT.
OCT 65 18P
REPT. NO. GARD-1244.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-629 633.

DESCRIPTORS: (*FALLOUT SHELTERS, VENTILATION),
(*VENTILATION, FALLOUT SHELTERS), PORTABLE,
PERFORMANCE(ENGINEERING), PACKAGING,
VENTILATION FANS, DRIVES, VENTILATION DUCTS,
PLASTIC, DESIGN, MECHANICAL DRAWINGS, CIVIL
DEFENSE SYSTEMS, COSTS (U)

CERTAIN FALLOUT SHELTERS IN THE UNITED STATES
REQUIRE VENTILATION SYSTEMS CAPABLE OF SUPPLYING FROM
5 TO ABOUT 30 CUBIC FEET PER MINUTE OF OUTSIDE AIR
PER PERSON SHELTERED IN ORDER TO ACHIEVE A HIGH
CONFIDENCE OF MAINTAINING TOLERABLE CONDITIONS OF
TEMPERATURE AND HUMIDITY DURING HOT WEATHER. THE
GOALS OF THIS DEVELOPMENT PROGRAM ARE PORTABILITY,
LOW COST, MANUAL AND ELECTRIC DRIVE, EASE AND
UNIVERSALITY OF APPLICATION. THE RESULTING
PACKAGE VENTILATION KIT (PVK) IS A COMPLETE
PACKAGED MECHANICAL VENTILATION SYSTEM THAT IS
PORTABLE, CAN BE ASSEMBLED AND DEPLOYED BY UNTRAINED
PERSONNEL, AND CAN BE DRIVEN EITHER ELECTRICALLY OR
BY HUMAN POWER. THE PVK CONSISTS OF TWO BASIS
PACKAGES -- A FAN ASSEMBLY AND DRIVE MODULE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 736 15/3 13/13
PROTECTIVE STRUCTURES DEVELOPMENT CENTER FORT BELVOIR
VA
FAMILY SHELTER WOOD A-FRAME. (U)
DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,
OCT 65 18P DEMBO, MICHAEL M. ;
LAMB, HERBERT C. ;
REPT. NO. PSDC-TR-10,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, CONSTRUCTION);
CIVIL DEFENSE SYSTEMS, MATERIALS, WOOD,
RADIOACTIVE FALLOUT, SHIELDING, VENTILATION,
BLOWERS, POWER SUPPLIES, COSTS (U)

CONSTRUCTION PLANS, DETAILS AND BILL OF MATERIALS
FOR A SIMPLE DUAL-PURPOSE WOOD A-FRAME TYPE FAMILY
FALLOUT SHELTER ARE PRESENTED. SHELTER FOR 10
PERSONS, BASED ON MINIMUM OCD SHELTER SPACE
REQUIREMENTS, IS PROVIDED. RADIATION SHIELDING TO
PROVIDE A PROTECTION FACTOR OF 100 IS PROVIDED BY
EARTH MOUNDING OVER THE WOOD FRAME. VENTILATION FOR
THE OCCUPIED SHELTER WOULD HAVE TO BE PROVIDED
THROUGH MANUAL OR MANUAL-ELECTRIC BLOWERS DEPENDING
ON AVAILABILITY OF ELECTRIC POWER DURING THE
OCCUPANCY PERIOD. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 914 5/1 13/13 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. THE
SELECTION AND RECRUITMENT OF SHELTER MANAGERS. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 65 87P SMITH, ROBERT W. ;
JEFFREYS, FRANK B. ;
REPT. NO. AIR-D938-6/65-TR(A-1),
PROJ: 1533A,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), (*CIVIL DEFENSE PERSONNEL, PERSONNEL
MANAGEMENT), SELECTION, RECRUITING, CIVIL
DEFENSE SYSTEMS, INSTRUCTION MANUALS,
EFFECTIVENESS (U)

THE DEVELOPMENT, FIELD-VERIFICATION, AND REVISION
OF GUIDANCE MATERIALS FOR THE SELECTION AND
RECRUITMENT OF SHELTER MANAGERS SUITABLE FOR USE BY
LOCAL CIVIL DEFENSE PERSONNEL WAS THE PURPOSE OF THE
PROJECT. THE SCOPE OF EXISTING GUIDANCE WAS
REDUCED BY ELIMINATING BOTH THE TRAINING GUIDANCE AND
THE DISCUSSION OF THE SUPPORTING METHODOLOGY. A
SAMPLE OF TEN REPRESENTATIVE COMMUNITIES WAS SELECTED
TO USE THE GUIDANCE TO IMPLEMENT A SELECTION AND
RECRUITMENT PROGRAM. DATA COLLECTED INCLUDED:
PREVIOUS SELECTION AND RECRUITMENT EFFORTS, COMMENTS
ON THE MATERIALS, EFFECTIVENESS OF SELECTION AND
RECRUITMENT PROGRAMS IMPLEMENTING THE GUIDANCE, AND
INFORMATION ON THE COMMUNITY. ALTHOUGH RESPONSE TO
THE PRINCIPLES WAS FAVORABLE, CONSIDERABLE DIFFICULTY
WAS ENCOUNTERED IN CONVINCING THE LOCAL CIVIL DEFENSE
PERSONNEL TO USE PERSONAL CONTACT IN SELECTION AND
RECRUITMENT. IN THOSE COMMUNITIES WHERE THE
GUIDANCE WAS APPLIED, THE RESULTS INDICATED THAT THE
GUIDE'S RECOMMENDED METHODS ARE SUPERIOR TO THE
MORE TRADITIONAL METHOD OF GENERAL REQUESTS FOR
VOLUNTEERS. FURTHER VERIFICATION OF THE GUIDANCE
WAS GAINED FROM OBSERVING A PILOT RECRUITMENT PROGRAM
CONDUCTED BY REGION, STATE, AND LOCAL CIVIL DEFENSE
WORKERS IN A WESTERN CITY. (AUTHOR) (U)

UNCLASSIFIED

D. C. REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 915 5/1 13/13 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. THE
SELECTION AND RECRUITMENT OF SHELTER MANAGERS. (U)
DESCRIPTIVE NOTE: SUMMARY TECHNICAL REPT.,
JUN 65 6P SMITH, ROBERT W. ;
JEFFREYS, FRANK B. ;
REPT. NO. AIR-D938-6/65-TR(A-11),

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), (*CIVIL DEFENSE PERSONNEL, PERSONNEL
MANAGEMENT), SELECTION, RECRUITING, CIVIL
DEFENSE SYSTEMS, INSTRUCTION MANUALS,
EFFECTIVENESS (U)

THE GUIDANCE MATERIALS FOR SELECTION AND
RECRUITMENT THAT WERE VERIFIED AND EVALUATED DURING
THIS STUDY WERE BASED UPON PORTIONS OF THE
A.I.R. REPORT, "THE RECRUITMENT,
SELECTION, AND TRAINING OF SHELTER MANAGERS
AND CORE STAFFS" (ENINGER AND FETTER, 1963).
THAT REPORT WAS MODIFIED IN A NUMBER OF WAYS FOR
APPLICATION TO ACTUAL SHELTER SITUATIONS. THE
CRITICAL COMMENTS INDICATED THAT MOST OF THE
REVIEWERS FELT THAT (1) THE GUIDE WAS
APPLICABLE TO BOTH THE REVIEWER'S SHELTER SITUATION
AND TO OTHER SHELTER SITUATIONS, AND (2) MOST OF
THE CONCEPTS PRESENTED IN THE GUIDE WERE USEFUL.
HOWEVER, THE REVIEWERS CONSISTENTLY CLASSED THE
RECOMMENDED DATA-GATHERING FORM AS TOO BURDENSOME AND
TOO IDEALISTIC. THE FINDINGS IN THE STUDY WERE
REFLECTED IN A MAJOR REVISION OF THE GUIDE, NOW
ENTITLED, "THE SELECTION AND RECRUITMENT OF
SHELTER MANAGERS," (SMITH AND JEFFREYS,
1965) (AD-629 914). THE SCOPE OF THE GUIDANCE
WAS REDUCED BY SEPARATING THE GUIDANCE FOR SELECTION
AND RECRUITMENT FROM TRAINING AND ELIMINATING THE
DISCUSSION OF THE SUPPORTING RESEARCH METHODOLOGY.
THE GUIDE PROVIDES MORE DETAILED RECOMMENDATIONS
IN A SIMPLE, "HOW-TO" FORMAT. SPECIFIC PROCEDURES,
RATHER THAN GENERAL PRINCIPLES, ARE GIVEN FOR BOTH
SELECTION AND RECRUITMENT, PROVIDING COMPREHENSIVE
GUIDANCE APPLICABLE TO THE ENTIRE RANGE OF SHELTER
SITUATIONS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 926 5/1 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. PLANNING
A GROUP SHELTER. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 65 JIP SMITH, ROBERT W. ILASKY, MARY
ANN;
REPT. NO. AIR-D93C-6/65-TR(1).

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), (*MANAGEMENT PLANNING, FALLOUT
SHELTERS), CIVIL DEFENSE SYSTEMS, DECISION
MAKING, INSTRUCTION MANUALS, TRAINING (U)

THE FIELD-VERIFICATION AND REVISION OF GUIDANCE
MATERIALS FOR INDIVIDUAL SHELTER PLANNING WAS THE
PURPOSE OF THE REPORT. THE EXISTING PLANNING
GUIDANCE WAS MODIFIED TO REFLECT CHANGES IN
TECHNOLOGY AND THE SHELTER PLANNING PHILOSOPHY, AND A
SAMPLE BASIC SHELTER PLAN WAS DEVELOPED FOR
INCLUSION IN THE GUIDE. THE SAMPLE CONSISTED OF
SIXTEEN COMMUNITIES SELECTED TO REVIEW AND APPLY THE
GUIDANCE. FOUR PLANS WERE WRITTEN DURING THE
APPLICATION OF THE GUIDANCE. THREE OF THESE PLANS
ADHERED CLOSELY TO THE AIR GUIDANCE MATERIALS AND
THE FOURTH PLAN DEALT PRIMARILY WITH SHELTER
PROCEDURES. THE CRITICAL COMMENTS MADE BY THE
REVIEWERS INDICATED THAT THERE WERE NO TECHNICAL
INACCURACIES AND THAT THE TECHNICAL BACKGROUND
INFORMATION IN THE GUIDE OVERLAPPED WITH THAT
PROVIDED IN SHELTER MANAGEMENT TRAINING. THE
FINDINGS IN THIS STUDY WERE REFLECTED IN A REVISION
OF THE GUIDE. THE GUIDE HAS GREATER EMPHASIS ON
SHELTER MANAGEMENT, A SECTION DEALING WITH PLANNING
FOR SHELTER SECURITY, AND MORE INFORMATION ON CLOSING
THE SHELTER. MINOR REVISIONS WERE MADE TO REFLECT
CHANGES IN TECHNOLOGY AND CHANGES IN THE FEDERAL
PROGRAM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 927 5/1 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. PLANNING
A GROUP SHELTER. (U)
DESCRIPTIVE NOTE: SUMMARY OF TECHNICAL REPT.,
JUN 65 6P SMITH, ROBERT W. LASKY, MARY
ANN ;
REPT. NO. AIR-D93C-6/65-TR(11),

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), (*MANAGEMENT PLANNING, FALLOUT
SHELTERS), CIVIL DEFENSE SYSTEMS, INSTRUCTION
MANUALS, EFFECTIVENESS (U)

DURING THE COURSE OF A PREVIOUS PROJECT FOR THE
OFFICE OF CIVIL DEFENSE, THE AMERICAN
INSTITUTES FOR RESEARCH DEVELOPED A GUIDANCE
DOCUMENT FOR INDIVIDUAL SHELTER PLANNING ENTITLED
PLANNING GUIDES FOR DUAL-PURPOSE SHELTERS
(SMITH AND LASKY, 1963) (AD-412 342). THE
INFORMATION PROVIDED IN THAT DOCUMENT WAS VALIDATED
THROUGH REVIEW BY KNOWLEDGABLE CIVIL DEFENSE
AUTHORITIES. THE QUESTION REMAINED, HOWEVER, AS TO
WHETHER LOCAL CIVIL DEFENSE PERSONNEL COULD
SUCCESSFULLY APPLY THIS GUIDANCE TO THE PREPARATION
OF ACTUAL SHELTER PLANS. THE PURPOSE OF THIS
PROJECT WAS TO CONDUCT FIELD VERIFICATION OF THE
PLANNING GUIDE AND TO REVISE THE DOCUMENT AS
REQUIRED. THE FINDINGS IN THIS STUDY WERE
REFLECTED IN A MAJOR REVISION OF THE GUIDE, NOW
ENTITLED PLANNING A GROUP SHELTER (SMITH AND
LASKY, 1965) (AD-629 926). CHAPTER 1 OF THE
GUIDE WAS REVISED TO CLARIFY THE NATURE OF SHELTER
PLANNING, SO THAT IT WOULD RECEIVE PROPER
CONSIDERATION BY SHELTER PLANNERS. THE SECOND CHAPTER
OF THE GUIDE WAS REVISED TO EMPHASIZE PLANNING FOR
SHELTER MANAGEMENT. A SECTION DEALING WITH
PLANNING FOR SHELTER SECURITY WAS ADDED TO THE GUIDE.
THE SECTION ON WARNING AND SHELTER ENTRY INCLUDES
MORE INFORMATION ON CLOSING THE SHELTER. MINOR
REVISIONS WERE MADE TO REFLECT CHANGES IN TECHNOLOGY
AND CHANGES IN THE FEDERAL PROGRAM WHICH OCCURRED
DURING THE COURSE OF THIS STUDY. (U)

UNCLASSIFIED

DNC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 935 5/1 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. SHELTER
MANAGER'S GUIDE. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 65 26P BRANDEGEE, ADA 5. 1
BEND, EMIL ;
REPT. NO. AIR-D93B-6/65-TR(C-1),
PROJ: 1533A,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), INSTRUCTION MANUALS, CIVIL DEFENSE
SYSTEMS, DECISION MAKING, DOCUMENTATION (U)

THE PURPOSE OF THE PROJECT WAS TO DEVELOP AND
EVALUATE IN-SHELTER GUIDANCE MATERIALS WHICH ANY
FALLOUT SHELTER MANAGER, TRAINED OR UNTRAINED, COULD
USE AS AN OPERATIONAL MANAGEMENT GUIDE. AN INITIAL
VERSION OF THE 'SHELTER MANAGER'S GUIDE' WAS
USED BY BOTH TRAINED MANAGERS AND EMERGENT LEADERS IN
24- AND 48-HOUR HABITABILITY STUDIES CONDUCTED BY THE
AMERICAN INSTITUTES FOR RESEARCH. AFTER THE
'SHELTER MANAGER'S GUIDE' WAS REVISED, IT WAS
EVALUATED IN AN EXPERIMENTAL COMPARISON WITH OTHER
TYPES OF GUIDANCE MATERIALS. THE FINAL PRODUCT IS
ARRANGED BY PRIORITY OF MANAGEMENT DECISIONS AND
ACTIONS WITHIN FIVE SHELTER PHASES: ENTRY,
INITIAL ORGANIZATION AND OPERATIONS, ROUTINE,
TEMPORARY EMERGENCE, AND CONTINGENCIES
(EMERGENCIES). IT PROVIDES THE MANAGEMENT
DECISION AND ACTIONS NECESSARY TO ORGANIZE AND
OPERATE A FALLOUT SHELTER, AND SUPPLIES THE
INFORMATION WHICH THE MANAGER NEEDS TO SUPPORT THESE
DECISIONS AND ACTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 939 5/1 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. VOLUME
1. INTRODUCTION TO SHELTER MANAGEMENT, (U)
JUN 65 300P BEND, EMIL; COLLINS, ROBERT
A. ;
REPT. NO. AIR-D930-6/65-RP(B),
PROJ: 1533A,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), MANAGEMENT PLANNING, SAFETY, FOOD,
PUBLIC HEALTH, SOCIAL PSYCHOLOGY, RADIOBIOLOGY,
TRAINING, CIVIL DEFENSE SYSTEMS, COMMUNICATION
SYSTEMS (U)

THE VOLUME IS DESIGNED AS A TRAINING TEXT. IT
PROVIDES AN OVERVIEW OF THE SCOPE AND NATURE OF THE
SHELTER MANAGER'S DUTIES AND RESPONSIBILITIES. THE
TEXT EMPHASIZES GENERAL MANAGEMENT PRINCIPLES AND
CONSIDERATIONS, RATHER THAN SPECIFIC OPERATIONAL
PROCEDURES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 940 5/1 13/13
AMERICAN INSTITUTE FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. VOLUME
11. PLANNING A GROUP SHELTER. (U)
DESCRIPTIVE NOTE: A PLANNING GUIDE,
JUN 65 167P SMITH, ROBERT W. ;
LASKY, MARY ANN ;
REPT. NO. AIR-D93C 6/65-RP.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-629 939.

DESCRIPTORS: (•FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (•MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), (•MANAGEMENT PLANNING, FALLOUT
SHELTERS), RADIATION MONITORS, CIVIL DEFENSE
SYSTEMS, MAINTENANCE, AIR CONDITIONING
EQUIPMENT, SAFETY, FOOD, LIGHTING EQUIPMENT,
COMMUNICATION SYSTEMS, SANITARY ENGINEERING (U)

THE VOLUME DEALS WITH THE PEACETIME
RESPONSIBILITIES OF THE SHELTER MANAGER WHICH FOCUS
UPON THE ACHIEVEMENT AND MAINTENANCE OF A STATE OF
OPERATIONAL READINESS OF A SHELTER FACILITY. THE
PLANNING GUIDE DISCUSSES THE PRINCIPAL FACTORS THAT
MUST BE CONSIDERED IN PLANNING AND DEVELOPING A GROUP
SHELTER. IT ALSO IDENTIFIES METHODS FOR MEETING
THE REQUIREMENTS ASSOCIATED WITH THESE FACTORS, AND
PRESENTS SPECIFIC INFORMATION THAT WOULD PERMIT THE
SHELTER MANAGER TO SELECT METHODS APPROPRIATE TO HIS
NEEDS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-629 941 5/1 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. VOLUME
III. SHELTER MANAGER'S GUIDE. (U)
DESCRIPTIVE NOTE: GUIDANCE FOR IN-SHELTER USE,
JUN 65 213P BRANDEGEE, ADA S. ;
BEND, EMIL ;
REPT. NO. AIR-D93B-6/65-RP(C),
PROJ: 1533A.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-629 940.

DESCRIPTORS: (FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), INSTRUCTION MANUALS, DECISION MAKING,
CIVIL DEFENSE SYSTEMS, DISASTERS, NUCLEAR
WARFARE, SURVIVAL, MAINTENANCE (U)

THE VOLUME WAS DEVELOPED FOR USE DURING THE PERIOD
OF SHELTER OCCUPANCY. THIS MEANS THAT THE CONTENT,
AS WELL AS ITS ORGANIZATION AND PRESENTATION, WAS
DESIGNED FOR OPTIMUM USEFULNESS UNDER EMERGENCY
CONDITIONS. THE GUIDE LISTS PRIORITY-ORDERED
MANAGEMENT ACTIONS AND DECISIONS, ARRANGED ACCORDING
TO THE PHASES OF A SHELTER STAY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-630 015 5/1 13/13 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT.
INTRODUCTION TO SHELTER MANAGEMENT. (U)
DESCRIPTIVE NOTES: TECHNICAL REPT.,
JUN 65 17P BEND, EMIL; COLLINS, ROBERT A.
;
REPT. NO. AIR-0938-6/65-TR(B-1),
PROJ: 1533A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), CIVIL DEFENSE SYSTEMS, TRAINING,
TEXTBOOKS (U)

THE PRODUCT OF THE RESEARCH DESCRIBED IN THIS
TECHNICAL REPORT WAS A TRAINING TEXT ENTITLED
'INTRODUCTION TO SHELTER MANAGEMENT.' THE
TEXT WAS DESIGNED FOR USE IN END-PRODUCT SHELTER
MANAGEMENT TRAINING. THE TECHNICAL REPORT ALSO
BRIEFLY DESCRIBES SEVERAL DIFFERENT APPROACHES TO
SHELTER MANAGEMENT TRAINING INTO WHICH THE TRAINING
TEXT CAN BE FIT. THE RECOMMENDED APPROACH WAS TO
USE THE TEXT AS BACKGROUND READING, AND TO USE CLASS
MEETINGS FOR DISCUSSIONS OF SPECIFIC PROBLEMS AND
GUIDANCE PERTINENT TO THE PARTICULAR GROUP OF SHELTER
MANAGER TRAINEES ATTENDING THE COURSE. THE CONTENT
AND ORGANIZATION OF THE TEXTBOOK ARE BRIEFLY
DESCRIBED IN THE REPORT, AND SUGGESTIONS ARE OFFERED
FOR FURTHER RESEARCH IN THE FIELD OF SHELTER
MANAGEMENT TRAINING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-630 016 5/1 13/13 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT.
INTRODUCTION TO SHELTER MANAGEMENT. (U)
DESCRIPTIVE NOTE: SUMMARY OF TECHNICAL REPT.,
JUN 65 6P BEND, EMIL ; COLLINS, ROBERT A.

REPT. NO. AIR-D93B-6/65-TR(B-11).

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), CIVIL DEFENSE SYSTEMS, TRAINING,
STANDARDIZATION, TEXTBOOKS (U)

THE TWO-FOLD GOAL OF THE PROJECT WAS TO PREPARE A
STANDARDIZED SHELTER MANAGEMENT TEXTBOOK AND TO
DEVELOP AN APPROACH TO SHELTER MANAGEMENT TRAINING
THAT WOULD PERMIT THE TEXT TO SERVE THE WIDEST
POSSIBLE RANGE OF TRAINING SITUATIONS. A NUMBER OF
INDIVIDUALS ASSOCIATED WITH THE TRAINING OF SHELTER
MANAGERS HAVE ATTESTED TO THE NEED OF A STANDARDIZED
INTRODUCTION TO SHELTER MANAGEMENT. IT WAS FELT
THAT THE DEVELOPMENT OF A TEXT WOULD BE A STEP
TOWARDS THE GOAL OF STANDARDIZED SHELTER MANAGEMENT
TRAINING. THERE WERE A NUMBER OF PROBLEMS INHERENT
IN THE DEVELOPMENT OF SUCH A STANDARDIZED APPROACH.
AMONG THESE PROBLEMS WERE: (1) THE GREAT
DIVERSITY IN SHELTER MANAGEMENT STUDENTS, IN TERMS OF
EDUCATIONAL BACKGROUND AND OCCUPATION; (2) THE
WIDE VARIATION IN CURRICULUM OF CURRENT SHELTER
MANAGEMENT TRAINING; AND (3) THE VARIETY OF
CONDITIONS IN LOCAL COMMUNITIES, INCLUDING SHELTER
CONFIGURATIONS, ENVIRONMENTAL, POLITICAL, AND SOCIAL
DIFFERENCES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-630 052 5/1 13/13 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
INTEGRATED GUIDANCE FOR SHELTER MANAGEMENT. SHELTER
MANAGER'S GUIDE. (U)
DESCRIPTIVE NOTE: SUMMARY OF TECHNICAL REPT.,
JUN 65 8P BRANDEGEE, ADA S. ;
BEND, EMIL ;
REPT. NO. AIR-D93B-6/65-TR(C-11),

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), CIVIL DEFENSE SYSTEMS, DECISION MAKING,
CIVIL DEFENSE PERSONNEL, TRAINING, INSTRUCTION
MANUALS, SURVIVAL (U)

THE GOAL OF THE PROJECT WAS TO PREPARE AND TEST A
'SHELTER MANAGER'S GUIDE' WHICH COULD BE USED
IN-SHELTER BY EITHER TRAINED OR UNTRAINED SHELTER
MANAGERS TO ORGANIZE AND RUN THE SHELTER. THE
GUIDE MUST SUPPLY THREE KINDS OF READY
INFORMATION: (1) THE STEP-BY-STEP DECISIONS AND
ACTIONS WHICH A MANAGER MUST MAKE TO ORGANIZE AND
OPERATE A FALLOUT SHELTER; (2) IMMEDIATE ANSWERS
TO CRITICAL SHELTER PROBLEMS OR CONTINGENCIES WHICH
MAY SUDDENLY ARISE; AND (3) THE SUPPORTING
DETAILS, INCLUDING: ACTUAL PROCEDURES, PERSONNEL
AND EQUIPMENT REQUIREMENTS; AND BACKGROUND
INFORMATION NEEDED TO IMPLEMENT THE DECISIONS AND
ACTIONS. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-631 424 13/13

IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
AN INVESTIGATION OF MINIMAL EQUIPMENT NEEDS IN
PERSONNEL SHELTERS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

JUN. 65 496P HAVERS, JOHN A. ;

MONK, CLAIRE B. , JR. ; KOELLER, ERICH H. ;

PROJ: 1200, IITRI-M6064(4)

TASK: 1210,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, DESIGN),
OPTIMIZATION, CIVIL DEFENSE SYSTEMS,
PERFORMANCE(ENGINEERING), PERSONNEL, COOLING
* VENTILATING EQUIPMENT, COSTS, SYSTEMS
ENGINEERING, EXPLOSION EFFECTS, PHYSIOLOGY,
SANITARY ENGINEERING

(U)

THE INVESTIGATION OF MINIMAL EQUIPMENT NEEDS
INCLUDED AN EXAMINATION OF THE PERFORMANCE
REQUIREMENTS FOR SHELTER EQUIPMENT SYSTEMS.
CONSIDERING THESE IN RELATION TO THE ATTACK-INDUCED
ENVIRONMENTAL FACTORS AND TO THE ANTICIPATED
CONDITIONS OF SHELTER OCCUPANCY. WITH THESE
PERFORMANCE REQUIREMENTS ONCE ESTABLISHED, SUITABLE
EQUIPMENT SYSTEMS ARE THEN IDENTIFIED. HERE A
MAJOR EMPHASIS IS PLACED UPON THE MINIMIZATION OF
EQUIPMENT NEEDS, AS DICTATED BY THE RESEARCH CONCEPT
OF THE 'AUSTERE' SHELTER. FINALLY, FOR ILLUSTRATIVE
PURPOSES, EQUIPMENT SYSTEMS ARE DESCRIBED FOR THE
THREE SHELTER SIZES AND FOR FOUR IDENTIFIED CLIMATIC
REGIONS. APPROXIMATE ESTIMATES OF EQUIPMENT COSTS
ARE INCLUDED.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-631 442 13/13

IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
AN INVESTIGATION OF MINIMAL EQUIPMENT NEEDS IN
PERSONNEL SHELTERS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

JUN 65 7P HAVERS, JOHN A.; MONK, CLAIRE

B., JR.; KOELLER, ERICH H. ;

PROJ: IITRI-M6064(4)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-631 424.

DESCRIPTORS: (*FALLOUT SHELTERS, DESIGN), CIVIL
DEFENSE SYSTEMS, SURVIVAL, EXPLOSION EFFECTS,
PHYSIOLOGY, SANITARY ENGINEERING, HAZARDS,
COOLING + VENTILATING EQUIPMENT (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-632 351 6/8
MIDWEST RESEARCH INST KANSAS CITY MO
FURTHER STUDIES ON THE DEVELOPMENT OF A NUTRITIONALLY
ADEQUATE FALLOUT SHELTER RATION. (U)
DESCRIPTIVE NOTE: FINAL REPT., PT. 1, 26 MAR 64-31 MAR
66,
MAR 66 38P NEWLIN, HARRISON E. ;
HAYES, GENE L. ;
PROJ: 1300, MRI-2769-B
TASK: 1310.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FOOD, FALLOUT SHELTERS),
NUTRITION, BREAD, CIVIL DEFENSE SYSTEMS,
DEHYDRATED FOODS, STORAGE, TASTE,
CARBOHYDRATES

(U)

NUTRITIONAL SUPPLEMENTS WERE DEVELOPED FOR
CONSUMPTION WITH PRESENTLY AVAILABLE SHELTER RATIONS.
WHEN CONSUMED AS DIRECTED, THESE SUPPLEMENTS WILL
SUPPLY ALL THE NUTRITIONAL FACTORS RECOGNIZED BY THE
NATIONAL RESEARCH COUNCIL AS ESSENTIAL FOR THE
MAINTENANCE OF ADULTS. THEY WILL EXTEND THE USE OF
SHELTER RATIONS TO SHELTER OCCUPANTS WHO REQUIRE
SPECIAL FEEDING, AND TO THE GENERAL POPULATION,
DURING THE POST-ATTACK PERIOD. THE SUPPLEMENTS ARE
OF TWO TYPES: UNFLAVORED COMPRESSED TABLETS; AND
DEHYDRATED SPREADS, FLAVORED SO THAT THEY WILL
ENHANCE THE PALATABILITY OF RATION BISCUIT, CRACKER,
AND WAFER. ACCELERATED STORAGE TESTS INDICATE THAT
(A) THE TABLETS HAVE A HIGH EXPECTED SHELF LIFE,
AND (B) THE FLAVOR OF THE SPREADS SHOULD BE
FURTHER STABILIZED. NEW MINT-TYPE AND TABLETED
GRANULAR STARCH CARBOHYDRATE SUPPLEMENTS WERE
DEVELOPED, WHICH ARE SOFT-TEXTURED AND FULLY
COMPATIBLE WITH THE MUCOUS MEMBRANES OF THE ORAL
CAVITY. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-632 963 13/1 13/13 15/3
GENERAL AMERICAN RESEARCH DIV GENERAL AMERICAN
TRANSPORTATION CORP NILES ILL
PREPRODUCTION PROTOTYPE PACKAGE VENTILATION KIT,
SECOND STRUCTURAL AND HUMAN FACTORS TEST. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
AUG 65 95P LIBOVICZ, BASIL A. ;
NEVERIL, ROBERT R. ; BEHLS, HERMAN F. ;
REPT. NO. GARD-1278-4.2.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUBCONTRACTED TO STANFORD RESEARCH
INST., CALIF., CONTRACT B-70925(4949A-28)-
US.

DESCRIPTORS: (*FALLOUT SHELTERS, *VENTILATION),
PORTABLE, CIVIL DEFENSE SYSTEMS, COOLING &
VENTILATING EQUIPMENT, TESTS, HUMAN ENGINEERING,
PERFORMANCE(ENGINEERING), SPECIFICATIONS (U)

A PORTABLE VENTILATION SYSTEM, DESIGNED FOR FALLOUT
SHELTERS, WAS MANUALLY OPERATED CONTINUOUSLY FOR TWO
WEEKS. THE PACKAGE VENTILATION KIT (PVK)
EVALUATED INCLUDED A FAN ASSEMBLY PLUS TWO
DRIVE MODULES. A PREVIOUS TEST HAD DISCLOSED
SOME MECHANICAL WEAKNESSES THAT WERE SUBSEQUENTLY
CHANGED. THE MODIFIED PVK FUNCTIONED WITHOUT ANY
FAILURES; THEREFORE, SPECIFICATION MIL-V-40646,
*PACKAGE VENTILATION KIT, 20-INCH FAN,
MODULAR DRIVE (CIVIL DEFENSE)*, WAS ISSUED
16 AUGUST 1965. MINOR IMPROVEMENTS TO THIS
SPECIFICATION ARE RECOMMENDED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-632 964 13/1 13/13 13/11 11/9
GENERAL AMERICAN RESEARCH DIV GENERAL AMERICAN
TRANSPORTATION CORP NILES ILL
FRICTION LOSS IN FLEXIBLE PLASTIC AIR DUCT. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
OCT 65 72P NEVERIL, ROBERT B. I
BEHLS, HERMAN F. I
REPT. NO. GARD-1278-2,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUBCONTRACTED TO STANFORD RESEARCH
INST., CALIF., CONTRACT B-70925(4949A-28)-
U.S.

DESCRIPTORS: (*FALLOUT SHELTERS, VENTILATION),
(*VENTILATION DUCTS, POLYETHYLENE PLASTICS),
(*PIPES, FRICTION), CIVIL DEFENSE SYSTEMS,
PRESSURE, FLEXIBLE STRUCTURES, SKIN FRICTION,
REDUCTION, GAS FLOW, COOLING + VENTILATING
EQUIPMENT (U)

TESTS WERE CONDUCTED TO DETERMINE THE PRESSURE DROP
CHARACTERISTICS OF 20-INCH DIAMETER, 4-MIL THICK,
POLYETHYLENE TUBING AND BOTH FACTORY AND SHELTER
FABRICATED 90-DEGREE ELBOWS. THE TESTS WERE
PERFORMED AT FLOW RATES RANGING FROM 1300 TO 4100
CUBIC FEET PER MINUTE. THESE PLASTIC COMPONENTS
ARE PART OF A PORTABLE VENTILATION SYSTEM THAT WAS
DEVELOPED FOR CIVIL DEFENSE FALLOUT SHELTERS,
SPECIFICATION MIL-V-40645. FULLY INFLATED
20-INCH DIAMETER PLASTIC TUBING HAS ABOUT THREE-
QUARTERS OF THE PRESSURE DROP OF SHEET-METAL DUCT.
HOWEVER, THE LAST FIFTY FEET OF A PLASTIC DUCT
SYSTEM, WHICH IS NOT COMPLETELY INFLATED, HAS 1-1/2
TO 3 TIMES THE PRESSURE DROP PER FOOT OF FULLY
INFLATED PLASTIC TUBING. THE RESULT IS THAT FOR
DUCT SYSTEMS OVER 100 FEET LONG THE PRESSURE DROPS
FOR SHEET-METAL AND PLASTIC TUBING ARE APPROXIMATELY
THE SAME. THE FRICTION LOSSES FOR BOTH FACTORY
FABRICATED AND SHELTER FABRICATED ELBOWS WERE
ESTABLISHED. A 40-INCH, SMOOTH RADIUS, 90-DEGREE
FACTORY FABRICATED ELBOW IS RECOMMENDED FOR USE WITH
THE CIVIL DEFENSE PACKAGE VENTILATION KIT.
THIS ELBOW DEVELOPS A PRESSURE DROP EQUIVALENT TO
60 FEET OF STRAIGHT TUBING. THE BEST SHELTER
FABRICATED ELBOW IS A THREE-PIECE ELBOW WITH A RADIUS
OF 60 INCHES THAT CAN BE FABRICATED FROM THE STRAIGHT
TUBING AND TAPE STOCKED IN THE PACKAGE
VENTILATION KIT. THIS ELBOW DEVELOPS A
PRESSURE DROP EQUIVALENT TO 90 FEET OF STRAIGHT
TUBING. (AUTHOR)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-635 501 15/3 5/9 5/10 13/13

GEORGIA V ATHENS

SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA. (U)

DESCRIPTIVE NOTE: FINAL REPT.

DEC 65 244P HAMMES, JOHN A. I

TASK: 1520,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS,

*ADJUSTMENT(PSYCHOLOGY)), (*CIVIL DEFENSE
SYSTEMS, *PERSONNEL MANAGEMENT), TRAINING,
CONFINED ENVIRONMENTS, CIVIL DEFENSE PERSONNEL (U)

FROM 1962 THROUGH 1965 THE UNIVERSITY OF
GEORGIA CIVIL DEFENSE RESEARCH STAFF
CONDUCTED EIGHT SIMULATED COMMUNITY FALLOUT SHELTER
OCCUPANCY TESTS FOR THE OFFICE OF CIVIL
DEFENSE. INVESTIGATED VARIABLES INCLUDED
ORGANIZATIONAL AND ENVIRONMENTAL FACTORS.
PARTICIPANTS WERE MEN, WOMEN, AND CHILDREN, AGED 1-
70 YEARS. THE LAST TWO 300-PERSON TESTS, CONDUCTED
IN 1965, FORM THE BASIS FOR THE REPORT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-635 502 15/2 5/9 5/10 13/13

GEORGIA UNIV ATHENS

SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA (APPENDICES).

(U)

DEC 65 196P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-635 501.

DESCRIPTORS: (*FALLOUT SHELTERS,
*ADJUSTMENT(PSYCHOLOGY)), (*CIVIL DEFENSE
SYSTEMS, *PERSONNEL MANAGEMENT), CONFINED
ENVIRONMENTS, MEDICAL EXAMINATIONS, TABLES,
PSYCHOMETRICS

(U)

CONTENTS: PRE-SHELTER QUESTIONNAIRE DATA;
MEDICAL RECORD DATA; STRUCTURED AND UNSTRUCTURED
DIARY DATA; ENVIRONMENTAL DATA; SHELTEREE
PERSONAL POSSESSIONS DATA; EMERGENCY OPERATING
CENTER PROGRAM.

(U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BKL27

AD-637 768 15/3 5/1

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
EMERGENCY OPERATIONS RESEARCH.

(U)

DESCRIPTIVE NOTE: SUMMARY REPT.

MAY 66 14P CUASACK, B. L. IFLINT, RHEA &
GIBBONS, R. D. IHANEY, T. P. IJARRETT, H. F. I
REPT. NO. TM(L)-2938/000/00,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS, MANAGEMENT
PLANNING), FALLOUT SHELTERS, REVIEWS, DISASTERS,
DATA PROCESSING SYSTEMS, FIRE SAFETY, DECISION
MAKING

(U)

THREE FINAL REPORT VOLUMES WERE ISSUED, WHICH
DOCUMENT IN DETAIL THE CONTRACT WORK ACTIVITIES.
THE CONTENTS OF EACH OF THESE THREE ARE BRIEFLY
SUMMARIZED IN THIS VOLUME. THE DOCUMENTS ARE:
TECHNICAL MEMORANDUM 2938/001 (AD-637 766) -
FINAL REPORT ON EMERGENCY OPERATIONS
SIMULATION RESEARCH - THIS REPORT DOCUMENTS
THOSE ASPECTS OF THE RESEARCH THAT WERE PRIMARILY
LABORATORY ORIENTED. TECHNICAL MEMORANDUM 2938/
002 (AD-637 767) - DATA PROCESSING FOR
LOCAL CIVIL DEFENSE: AN INVESTIGATION OF
THE POTENTIALS - THIS REPORT PRESENTS TO OGD
THE NECESSARY CONSIDERATIONS THAT MUST BE MET BEFORE
A LOCAL DIRECTOR DECIDES TO UTILIZE DATA-PROCESSING
EQUIPMENT FOR LOCAL CIVIL DEFENSE. TECHNICAL
MEMORANDUM 2938/003 (AD-637 765) - FIRE
DATA FROM THE WATTS RIOT: RESULTS OF
PRELIMINARY ANALYSIS AND EVALUATION - THIS
REPORT DOCUMENTS THE RESULTS OF A PRELIMINARY
ANALYSIS AND EVALUATION OF DATA FROM THE WATTS
RIOT PROVIDED BY THE U. S. DEPARTMENT OF
AGRICULTURE, U. S. FOREST SERVICE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-637 806 15/3 13/12
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
SHELTER HABITABILITY IN EXISTING BUILDINGS UNDER FIRE
EXPOSURE. (U)
DESCRIPTIVE NOTE: FINAL SUMMARY RESEARCH REPT., MAY 65-
JAN 66.
JUN 66 149P WATERMAN, THOMAS E. ;
REPT. NO. M6121;
CONTRACT: N228(62479)-68355,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FALLOUT SHELTERS, *FIRE SAFETY,;
CIVIL DEFENSE SYSTEMS, BUILDINGS, WOOD, CERAMIC
MATERIALS, FIRES, COMBUSTION PRODUCTS, FLUID
MECHANICS (U)

EXPERIMENTS WERE PERFORMED IN FULL SCALE BUILDINGS
TO OBTAIN INFORMATION REGARDING THE HABITABILITY OF
FALLOUT SHELTERS IN EXISTING BUILDINGS UNDER FIRE
EXPOSURE. ONE TWO-STORY AND TWO THREE-STORY
BUILDINGS OF MASONRY AND WOOD JOIST CONSTRUCTION WERE
USED. THE FIRE LOAD OF THE ROOM OF FIRE ORIGIN
CONSISTED OF A LARGE CRIB (2X4 INCH LUMBER) WITH
THE REMAINDER OF THE STRUCTURES LOADED WITH FURNITURE
TYPICAL OF RESIDENTIAL CONSTRUCTION. RESULTS
INDICATE THAT OXYGEN DEPLETION IN AN ACTIVE FIRE ZONE
WILL BE REPRODUCED THROUGHOUT INTERCONNECTING SPACES.
CARBON MONOXIDE CONCENTRATIONS OF 75 PERCENT OF
THOSE IN THE ACTIVE FIRE ZONE WERE FOUND AT PLACES
REMOVED FROM THE FIRE BUT ON THE SAME OR HIGHER
LEVELS. FOR THESE BUILDINGS, WIND-INDUCED PRESSURE
DIFFERENCES WERE GREATER THAN FIRE-INDUCED PRESSURE
DIFFERENCES AND THUS WOULD HAVE HAD GREATER EFFECT ON
THE INFILTRATION OF FIRE GASES THROUGH SHELTER
BARRIERS. THE LONG LASTING EFFECTS DEBRIS FIRES IN
CONTACT WITH THE SHELTER WERE FOUND TO PRODUCE
DANGEROUS HEATING OF THE SHELTER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-640 823 6/8

GEORGIA EXPERIMENT STATION EXPERIMENT
STORAGE STABILITY OF CIVIL DEFENSE SHELTER
RATIONS.

(U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 4, 21 JUN 65-30 JUN
66.

OCT 66 77P WOODROOF, J. G. ICECIL, S. R. &
CONTRACT: JA-19-129-QM-2050(N), OCD-OS-62-156
MONITOR: USA-NLABS TR-67-25-CD

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FOOD, STORAGE), STABILITY,
CIVIL DEFENSE SYSTEMS, PRESERVATION, FIBERBOARD,
CONTAINERS, PHYSICAL PROPERTIES, TASTE,
FALLOUT SHELTERS

(U)

PROGRESS IS REPORTED ON STORAGE OF (1) 4 LOTS
OF SURVIVAL CRACKERS, 4 LOTS OF SURVIVAL BISCUITS,
AND 4 LOTS OF BULGUR WAFERS FOR 36 MONTHS, AND (2)
3 LOTS OF CARBOHYDRATE SUPPLEMENT FOR 18 AND 24
MONTHS, AT 100F/80% R.H., 100/57%, 70/80%,
70/57%, 40/57%, AND OF TWO SPECIAL CASES OF
BISCUITS FROM APPROXIMATELY 42 MONTHS STORAGE IN A
GSA COMMON STORAGE WAREHOUSE ARE ALSO REPORTED ON.
DATA INCLUDE (A) BURSTING STRENGTH, MOISTURE,
AND GENERAL CONDITION OF V3C FIBERBOARD CASES,
(B) CORROSION, COATING DEFECTS, AND LEAKAGE OF 2
1/2-GAL. AND 5-GAL. METAL CANS, (C) GENERAL
PACKAGE AND PRODUCT CONDITION, (D) RESIDUAL
OXYGEN, FRACTURE STRENGTH, MOISTURE, PEROXIDES, AND
FREE FATTY ACIDS OF THE WHEAT PRODUCTS, (E)
MOISTURE, PH, AND SUGARS OF THE SUPPLEMENTS, AND
(F) COLOR, SENSORY QUALITY AND HEDONIC RATINGS
FOR ALL PRODUCTS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-641 645 15/3 13/13 5/11
IOWA AGRICULTURAL AND HOME ECONOMICS EXPERIMENT STATION
AMES DEPT OF SOCIOLOGY AND ANTHROPOLOGY
ADOPTION OF PUBLIC FALLOUT SHELTERS, A 1964 NATIONAL
STUDY. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
66 349P KLONGLAN, GERALD E. ;
BEAL, GEORGE M. ; BOHLEN, JOE M. ;
REPT. NO. RURAL SOCIOLOGY-49
TASK: 4811-E

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-641 646.

DESCRIPTORS: (*FALLOUT SHELTERS, PUBLIC
OPINION), CIVIL DEFENSE SYSTEMS, ATTITUDES,
PERCEPTION, ANALYSIS, NUCLEAR WARFARE (U)

A MODEL OF THE ADOPTION PROCESS IS USED TO ANALYZE
THE PUBLIC'S PROGRESS IN ADOPTING THE IDEA OF USING
PUBLIC FALLOUT SHELTERS IN THE EVENT OF NUCLEAR
ATTACK. THE ANALYSIS IS BASED ON FINDINGS FROM THE
1964 OCD NATIONAL SURVEY OF 1464 RESPONDENTS.
RESPONDENTS ARE ASSIGNED TO ONE OF FIVE ADOPTION
STAGES: 44.7% OF THE RESPONDENTS WERE UNAWARE OF
THE EXISTENCE OF PUBLIC FALLOUT SHELTERS (UNAWARE
STAGE); 10.2% WERE AWARE OF PUBLIC FALLOUT
SHELTERS BUT HAD NO ADDITIONAL INFORMATION ABOUT THEM
(AWARE STAGE); 16.6% WERE AWARE OF AND HAD
ADDITIONAL INFORMATION ABOUT PUBLIC FALLOUT SHELTERS
BUT HAD NOT THOUGHT ABOUT USING THEM (INFORMATION
STAGE); 10.2% WERE AWARE OF, HAD ADDITIONAL
INFORMATION, AND HAD THOUGHT ABOUT USING PUBLIC
FALLOUT SHELTERS BUT HAD NOT DECIDED TO GO TO A
PUBLIC FALLOUT SHELTER (EVALUATION STAGE);
18.2% WERE AWARE OF, HAD ADDITIONAL INFORMATION,
HAD THOUGHT ABOUT USING AND HAD DECIDED TO GO TO A
PUBLIC FALLOUT SHELTER IN THE EVENT OF NUCLEAR ATTACK
(ADOPTION STAGE). THE RELATIONSHIPS BETWEEN
SELECTED DEMOGRAPHIC AND ATTITUDE VARIABLES AND STAGE
OF ADOPTION OF PUBLIC FALLOUT SHELTERS ARE ANALYZED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-641 646 15/3 13/13 5/11
IOWA AGRICULTURAL AND HOME ECONOMICS EXPERIMENT STATION
AMES DEPT OF SOCIOLOGY AND ANTHROPOLOGY
ADOPTION OF PUBLIC FALLOUT SHELTERS, A 1964 NATIONAL
STUDY. (U)
DESCRIPTIVE NOTE: SUMMARY OF THE FINAL REPT.,
66 34P KLONGLAN, GERALD E. ;
BEAL, GEORGE M. ; BOHLEN, JOE M. ;
REPT. NO. RURAL SOCIOLOGY-49S
TASK: 4811-E

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-641 645.

DESCRIPTORS: (*FALLOUT SHELTERS, PUBLIC
OPINION), CIVIL DEFENSE SYSTEMS, ATTITUDES,
PERCEPTION, ANALYSIS, NUCLEAR WARFARE (U)

A MODEL OF THE ADOPTION PROCESS IS USED TO ANALYZE
THE PUBLIC'S PROGRESS IN ADOPTING THE IDEA OF USING
PUBLIC FALLOUT SHELTERS IN THE EVENT OF NUCLEAR
ATTACK. THE ANALYSIS IS BASED ON FINDINGS FROM THE
1964 OCD NATIONAL SURVEY OF 1464 RESPONDENTS.
RESPONDENTS ARE ASSIGNED TO ONE OF FIVE ADOPTION
STAGES: 44.7% OF THE RESPONDENTS WERE UNAWARE OF
THE EXISTENCE OF PUBLIC FALLOUT SHELTERS (UNAWARE
STAGE); 10.2% WERE AWARE OF PUBLIC FALLOUT
SHELTERS BUT HAD NO ADDITIONAL INFORMATION ABOUT THEM
(AWARE STAGE); 16.6% WERE AWARE OF AND HAD
ADDITIONAL INFORMATION ABOUT PUBLIC FALLOUT SHELTERS
BUT HAD NOT THOUGHT ABOUT USING THEM (INFORMATION
STAGE); 10.2% WERE AWARE OF, HAD ADDITIONAL
INFORMATION, AND HAD THOUGHT ABOUT USING PUBLIC
FALLOUT SHELTERS BUT HAD NOT DECIDED TO GO TO A
PUBLIC FALLOUT SHELTER (EVALUATION STAGE);
18.2% WERE AWARE OF, HAD ADDITIONAL INFORMATION,
HAD THOUGHT ABOUT USING AND HAD DECIDED TO GO TO A
PUBLIC FALLOUT SHELTER IN THE EVENT OF NUCLEAR ATTACK
(ADOPTION STAGE). THE RELATIONSHIPS BETWEEN
SELECTED DEMOGRAPHIC AND ATTITUDE VARIABLES AND STAGE
OF ADOPTION OF PUBLIC FALLOUT SHELTERS ARE ANALYZED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-641 701 13/13 13/1
GENERAL AMERICAN RESEARCH DIV GENERAL AMERICAN
TRANSPORTATION CORP NILES ILL
NATURAL VENTILATION TEST OF AN ABOVEGROUND FALLOUT
SHELTER IN CHICAGO, ILLINOIS, (U)
AUG 66 82P HENNINGER, ROBERT M. ;
MADSON, CHARLES A. ;
REPT. NO. GARD-1268-81

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NOT REPRODUCIBLE BY CFSTI
STANDARDS.

DESCRIPTORS: (*FALLOUT SHELTERS, VENTILATION),
TESTS, WIND, TEMPERATURE, HUMIDITY, ILLINOIS,
CIVIL DEFENSE SYSTEMS (U)

THE RESULTS ARE REPORTED ON A NATURAL VENTILATION
TEST OF A CORRIDOR-TYPE SHELTER LOCATED IN CHICAGO.
THE EFFECTIVE TEMPERATURE OF THIS SHELTER WHEN
OCCUPIED AT A DENSITY OF 10 SQUARE FEET PER PERSON
WILL NOT EXCEED 83F FOR MORE THAN SEVEN DAYS DURING
AN AVERAGE YEAR. THIS INTERIM REPORT DESCRIBES
ENVIRONMENTAL TESTS PERFORMED IN A SPECIFIC SHELTER.
THE DISCUSSION OF THE RESULTS IS PRELIMINARY AND
SHOULD NOT BE USED AS THE BASIS FOR GENERAL
CONCLUSIONS. A SUBSEQUENT FINAL REPORT WILL
INCLUDE A COMPARATIVE EVALUATION OF DATA FROM
SUBSEQUENT TESTS HAVING A VARIETY OF CONFIGURATIONS
AND LOCATIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-642 241 13/12 11/7 13/13 15/3
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
DEVELOPMENT OF FIRE RESISTANCE RATINGS FOR SHELTER
COMPONENTS. (U)
DESCRIPTIVE NOTE: FINAL REPT. MAY 65-FEB 66.
MAR 66 70P WATERMAN, T. E. ISALZBERG, F. G.
REPT. NO. M6125
CONTRACT: N228(62479)-6580
MONITOR: USNRDL TRC-39

UNCLASSIFIED REPORT

DESCRIPTORS: (*FIRE RESISTANT MATERIALS, *FALLOUT
SHELTERS), FIRE SAFETY, CIVIL DEFENSE SYSTEMS,
BRICK, CALCIUM COMPOUNDS, SULFATES, HYDRATES,
WOOD, FLAMMABILITY, FIBERBOARD, TEMPERATURE,
PRESSURE, MEASUREMENT, THERMAL RADIATION (U)

EXPERIMENTS WERE PERFORMED TO EVALUATE THE
RESPONSES OF SHELTER COMPONENTS TO TYPICAL FIRE
EXPOSURES IN ORDER TO DEVELOP MEANS FOR PREDICTING
THESE RESPONSES FROM THE RESULTS OF A MINIMUM NUMBER
OF STANDARDIZED TESTS. EXPOSURES WERE PROVIDED BY
AN INFRARED LAMPBANK. SAMPLES INCLUDED MATERIAL OF
BOTH HIGH AND LOW INSULATING QUALITIES, INERT
MATERIALS, AND THOSE EXHIBITING ABLATIVE AND
DEHYDRATION PROCESSES. EACH SAMPLE WAS
APPROXIMATELY 16-IN. WIDE, 24-IN. HIGH AND 2-IN.
THICK. RESULTS INDICATE THAT FIRE RESISTANCE OF A
BARRIER IS CONSIDERABLY AFFECTED BY THE INTENSITY OF
EXPOSURE. FOR HOMOGENEOUS COMBUSTIBLE MATERIALS,
THIS EFFECT CAN BE EXPRESSED APPROXIMATELY IN TERMS
OF THE AREA EQUIVALENCE METHOD SUGGESTED BY
INGBERG. FOR HOMOGENEOUS NON-COMBUSTIBLE
MATERIALS, CONTAINING FREE WATER, THIS METHOD
PRODUCED ERRORS RANGING FROM 10 TO 31 PERCENT.
THIS ERROR IS SUBSTANTIALLY LARGER FOR MATERIALS
CONTAINING BOTH FREE AND CHEMICALLY-COMBINED WATER.
IN THE CASE OF NON-HOMOGENEOUS MATERIALS, THE ERROR
RANGED FROM 62 TO 86 PERCENT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-642 296 5/10 15/3
HRB-SINGER INC STATE COLLEGE PA
THE PSYCHOLOGICAL ENVIRONMENT OF PROTECTIVE
SHELTERS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JUL 66 146P WRIGHT, G. H. ; FENSTERMACHER, N.
H. ;
REPT. NO. HRB-75111-2F
PROJ: OCD-1500
TASK: 1510

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-642 315.

DESCRIPTORS: (*CONFINEMENT(PSYCHOLOGY),
*FALLOUT SHELTERS), (*CONFINED ENVIRONMENTS,
FALLOUT SHELTERS), STRESS(PSYCHOLOGY), SOCIAL
PSYCHOLOGY, REACTION(PSYCHOLOGY), BEHAVIOR,
ADJUSTMENT(PSYCHOLOGY), CIVIL DEFENSE SYSTEMS,
STATISTICAL ANALYSIS, FEAR, PSYCHOMETRICS,
PERCEPTION(PSYCHOLOGY), LEADERSHIP (U)

THE STUDY WAS DESIGNED TO CROSS-VALIDATE MEASURING INSTRUMENTS, TO PROVIDE A REFINEMENT OF METHODOLOGY FOR USE IN FUTURE SHELTER STUDIES, TO INVESTIGATE THE EFFECTS OF SPECIFIED SHELTER RELEVANT STRESSES, AND TO APPROXIMATE A STANDARD FOR EVALUATION OF INDICES OF PSYCHO-SOCIAL STRESSES OCCURRING IN SHELTER CONFINEMENT. THESE PURPOSES WERE ACCOMPLISHED BY COMPARING THE REACTIONS OF TWO EQUIVALENT GROUPS, ONE SUBJECTED TO SELECTED STRESSES AND THE OTHER NOT, ON SPECIFICALLY DESIGNED RATING FORMS, TESTS, AND EXPERIMENTAL TASKS. ALL OTHER CONDITIONS OF CONFINEMENT WERE EQUIVALENT FOR THE TWO GROUPS. THE VALIDATION PROCEDURE CONSISTED OF COMPARISONS BETWEEN THE ORIGINAL GROUP FROM THE PSYCHIATRIC HOSPITALS AND BOTH GROUPS FROM THE SHELTER CONFINEMENTS. ADDITIONAL INFORMATION WAS OBTAINED THROUGH THE USE OF TWO GROUPS IN THE VALIDATION PORTION OF THE STUDY. THE RESULTS OF THE STUDY INDICATED THAT A SHELTER GROUP WHO RECEIVED SUPPLEMENTARY PSYCHOLOGICAL SUPPORTS EVIDENCED A GREATER ACCEPTANCE OF CONFINEMENT THAN THE GROUP FOR WHOM NONE WERE PROVIDED. THE EXPERIMENTAL DATA VALIDATED PREVIOUS FINDINGS AND SHOWED THAT CERTAIN BEHAVIORS APPEAR TO BE IMPORTANT IN THE PSYCHOLOGICAL ENVIRONMENTS THAT EXIST AT THE BEGINNING OF AND FOLLOWING A PERIOD OF CONFINEMENT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-644 505 5/1 - 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
AN EXPERIMENTAL STUDY OF "INTEGRATED GUIDANCE FOR
SHELTER MANAGEMENT". (U)
DESCRIPTIVE NOTE: FINAL SUMMARY REPT.,
SEP 66 13P SMITH, ROBERT W. BEND, EMIL
JEFFREYS, FRANK B. COLLINS, ROBERT A. :

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *MANAGEMENT
ENGINEERING), TEXTBOOKS, INSTRUCTION MANUALS,
EFFECTIVENESS, MANAGEMENT PLANNING, TRAINING,
CIVIL DEFENSE SYSTEMS, CIVIL DEFENSE PERSONNEL (U)

IN 1965, THE AMERICAN INSTITUTES FOR RESEARCH
PRODUCED A SET OF DOCUMENTS DESIGNED TO AID PERSONS
WITH SHELTER MANAGEMENT RESPONSIBILITIES IN CARRYING
OUT BOTH THEIR PEACETIME AND EMERGENCY DUTIES. THE
FIRST VOLUME IN THE SET IS A TRAINING TEXT WHICH
SERVES AS AN INTRODUCTION TO THE SUBJECT OF SHELTER
MANAGEMENT. THE SECOND VOLUME IS A GUIDANCE
DOCUMENT FOR PLANNING A GROUP FALLOUT SHELTER. THE
FINAL DOCUMENT IS FOR IN-SHELTER USE, TO ASSIST THE
MANAGEMENT STAFF IN ORGANIZING AND OPERATING A
SHELTER UNDER OCCUPANCY CONDITIONS. TOGETHER, THE
THREE DOCUMENTS MAKE UP AN INTEGRATED GUIDANCE
PACKAGE WHICH COVERS THE BROAD RANGE OF INFORMATION
AND ACTION REQUIREMENTS FOR SHELTER PLANNING AND
MANAGEMENT. THE OBJECTIVE OF THE RESEARCH PROGRAM
DESCRIBED IN THIS REPORT WAS TO OBTAIN EMPIRICAL DATA
ON THE INDIVIDUAL EFFECTIVENESS OF THESE GUIDANCE
DOCUMENTS AND TO ASSESS THE EFFECTIVENESS OF VARIOUS
COMBINATIONS OF THESE MATERIALS IN ENHANCING THE
PEACETIME AND EMERGENCY SHELTER MANAGEMENT FUNCTIONS.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-644 875 5/1 15/3 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
STUDIES OF IN-SHELTER MANAGEMENT GUIDANCE
MATERIALS. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 66 48P BEND, EMIL ; UNTERWAGNER, JAMES
; MCINTYRE, FRANK F. ;
REPT. NO. AIR-D-93C1-9/66-FR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-644 878.

DESCRIPTORS: (*FALLOUT SHELTERS, *MANAGEMENT
ENGINEERING), CIVIL DEFENSE SYSTEMS, MATERIALS,
HANDBOOKS, TRAINING DEVICES, CIVIL DEFENSE
PERSONNEL (U)

THE REPORT DESCRIBES TWO SMALL SCALE RESEARCH
EFFORTS DEALING WITH THE SUBJECT OF MANAGEMENT
GUIDANCE MATERIALS FOR USE IN-SHELTER. THE FIRST
EFFORT CULMINATED IN A PROTOTYPE ABBREVIATED
GUIDANCE AID DESIGNED FOR THE SMALL (UNDER 50
PERSON) SHELTER. THIS VERSION TRIED TO AVOID SOME
OF THE SHORTCOMINGS OF PREVIOUS MANAGEMENT GUIDANCE
DOCUMENTS, SUCH AS LARGE SIZE OR INFLEXIBILITY OF
USE. THE SECOND SECTION OF THIS REPORT IS BASED ON
A REVIEW OF THE RELATIVELY MEAGER LITERATURE ON THE
PREPARATION OF WRITTEN MATERIALS FOR EMERGENCY USE.
IT DISCUSSES THE MAJOR GRAPHIC ART FACTORS THAT
SHOULD BE CONSIDERED IN DEVELOPING EMERGENCY GUIDANCE
MATERIALS AND PROVIDES RECOMMENDATIONS FOR GUIDANCE
PREPARATION WHERE APPROPRIATE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-644 878 5/1 15/3 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
AN EXPERIMENTAL STUDY OF INTEGRATED GUIDANCE FOR
SHELTER MANAGEMENT. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
SEP 66 182P SMITH, ROBERT W. ; BEND, ENIL
; JEFFREYS, FRANK B. ; COLLINS, ROBERT A. ;
REPT. NO. AIR-D93B(142)-9/66-FR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-644 875.

DESCRIPTORS: (FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), CIVIL DEFENSE SYSTEMS, MANAGEMENT
PLANNING, CIVIL DEFENSE PERSONNEL, TRAINING
DEVICES, HANDBOOKS, EXPERIMENTAL DESIGN (U)

A THREE-VOLUME PACKAGE OF INTEGRATED SHELTER
MANAGEMENT MATERIAL WAS RECENTLY PRODUCED FOR
APPLICATION TO SHELTER MANAGEMENT TRAINING, SHELTER
PLANNING, AND IN-SHELTER MANAGEMENT. THIS REPORT
DEALS WITH AN EXPERIMENT TO OBTAIN EMPIRICAL DATA ON
THE INDIVIDUAL EFFECTIVENESS OF THESE DOCUMENTS AS
WELL AS THE IMPACT OF VARIOUS COMBINATIONS OF THESE
MATERIALS ON SHELTER PLANNING AND SHELTER MANAGEMENT.
THE DEPENDENT VARIABLES INVOLVED IN THE EXPERIMENT
WERE PERFORMANCE ON A SHELTER PLANNING TEST AND
A SHELTER MANAGEMENT TEST. THE INDEPENDENT
VARIABLES INCLUDED SHELTER MANAGEMENT TRAINING, USE
OF A SHELTER OCCUPANCY EXERCISE, SHELTER PLANNING
ORIENTATION AND PLANNING EXPERIENCE, THE PRESENCE OR
ABSENCE OF SHELTER MANAGEMENT GUIDANCE, THE NATURE OF
THE SHELTER SITUATION, AND THE BACKGROUND (STUDENT
VS. EXECUTIVE) OF THE SUBJECTS. THE RELATIONSHIP
OF MENTAL ABILITY TO BOTH OF THE DEPENDENT VARIABLES
ALSO WAS MEASURED AND CONTROLLED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-645 285 15/3 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
AN EVALUATION OF THE ROLE OF FEDERAL PERSONNEL IN
RECRUITING SHELTER MANAGERS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
SEP 66 59P JEFFREYS, J RANK B. ;
SMITH, ROBERT W. ;
REPT. NO. AIR-D93B(1)-9/66-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, MANAGEMENT
ENGINEERING), (*GOVERNMENT EMPLOYEES,
RECRUITING), CIVIL DEFENSE SYSTEMS, SELECTION,
PERFORMANCE(HUMAN), URBAN AREAS, COSTS,
CIVIL DEFENSE PERSONNEL, TRAINING (U)

THE PURPOSE OF THE PRESENT STUDY HAS BEEN TO
EVALUATE FEDERAL PERSONNEL AS SHELTER MANAGER
RECRUITERS AND TO ANALYZE THE EXPERIENCES OF THESE
RECRUITERS IN VARIOUS METROPOLITAN AREAS. THE
SAMPLE CONSISTED OF FOUR CITIES FROM THREE OF THE
EIGHT OCD REGIONS. CITY 1 AND CITY 2 CONDUCTED
PROGRAMS SPECIFICALLY FOR THE STUDY. ADDITIONAL
DATA WERE GATHERED FROM AN ON-GOING RECRUITMENT
PROGRAM IN CITY 3 AND FROM THE EFFORTS OF AN OFFICE
BUILDING COMPLEX IN CITY 4. CITY 1 AND CITY 2
USED PERSONAL CONTACT WITH TEAMS CONSISTING OF BOTH
FEDERAL AND LOCAL PERSONNEL. CITY 3 USED
PERSONAL CONTACT BY LOCAL PERSONNEL ONLY, AND THE
OFFICE BUILDING COMPLEX IN CITY 4 RECRUITED THROUGH
A GROUP MEETING AND LETTER CAMPAIGN. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-645 286 15/3 5/9
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
SOME TRAINING IMPLICATIONS OF LARGE SHELTERS. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 66 43P BEND, EMIL ;
REPT. NO. AIR-D-9381-9/66-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, MANAGEMENT
ENGINEERING), (*SUPERVISORY PERSONNEL, TRAINING),
CIVIL DEFENSE SYSTEMS, MANAGEMENT PLANNING,
LEADERSHIP, SIMULATION, MANAGEMENT CONTROL
SYSTEMS, DECISION MAKING,
PERFORMANCE (HUMAN) (U)

BASED LARGELY UPON CONCURRENT AIR RESEARCH IN THE
AREA OF SHELTER MANAGEMENT SIMULATION, AN ANALYSIS OF
THE IMPACT OF THE LARGE, COMPLEX SHELTER ON SHELTER
MANAGEMENT TRAINING NEEDS WAS CONDUCTED. THE LARGE
SHELTER IS SEEN AS REQUIRING THE TYPE OF OVERALL
LEADERSHIP THAT ONLY PERSONS WITH PRE-EXISTING
SUPERVISORY SKILLS CAN SUPPLY. SUCH PEOPLE ARE, BY
AND LARGE, NEITHER ATTRACTED NOR HELPED BY THE
STANDARD SHELTER MANAGEMENT TRAINING COURSE. THE
OBJECTIVES OF EXECUTIVE SHELTER MANAGEMENT TRAINING
SHOULD BE (1) TO REVEAL TO THE STUDENT THE
COMPLEXITY OF THE LARGE SHELTER AND THE TYPES OF
PROBLEMS THAT CAN THREATEN ITS INTEGRITY, AND (2)
TO IDENTIFY AND DRAMATIZE THE DIFFERENCES BETWEEN
PEACETIME AND EMERGENCY MANAGEMENT. TO ACHIEVE
THESE OBJECTIVES IT IS RECOMMENDED THAT TRAINING FOR
EXECUTIVE SHELTER MANAGERS INCORPORATE (1) A
PLANNING SESSION IN WHICH TRAINEES PARTICIPATE IN
DEVELOPING A SHELTER PLAN FOR A LARGE, COMPLEX PUBLIC
SHELTER, AND (2) A LARGE SHELTER SIMULATION GAME
PLAYED DURING THE OCCUPANCY EXERCISE IN WHICH THE
STUDENTS ASSUME THE ROLES OF AN EXECUTIVE CADRE OF A
LARGE SHELTER. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH DATE 1007 JUL 27

AD-645 243 1971 1973 1975
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
AN EXPERIMENTAL ANALYSIS OF SELECTED PROBLEMS OF
LARGE-SHELTER MANAGEMENT, ENVIRONMENTAL THREAT, AND
SMALL-SHELTER HABITABILITY UNDER CONDITIONS OF
STRESS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 66 220P MALE, JOHN F. ;
MEAGLEY, DONALD E. ; SMITH, ROBERT W. ;
DAVIS, ROBERT L. ;
REPT. NO. AIR-D93A(1/2)-9/66-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), CONFINED ENVIRONMENTS,
STRESS(PSYCHOLOGY), UNDERWATER, BEHAVIOR,
ANXIETY, CIVIL DEFENSE PERSONNEL, SUPERVISORY
PERSONNEL, GAME THEORY, DECISION MAKING,
TRAINING, LEADERSHIP, SIMULATION, SOCIAL
PSYCHOLOGY (U)

THE RESEARCH PROGRAM WAS COMPOSED OF THREE MAJOR
EFFORTS: (1) THE INITIAL DEVELOPMENT OF AND THE
FEASIBILITY TESTING OF A LARGE-SHELTER CONTINGENCY
GAME FOR USE IN THE ANALYSIS OF PROBLEMS ASSOCIATED
WITH LARGE-SHELTER MANAGEMENT; (2) THE
DEVELOPMENT OF TECHNIQUES FOR AND THE FEASIBILITY OF
THE USE OF AN UNDERWATER SHELTER AS A METHOD FOR
PRODUCING AN EXPERIMENTAL ANALOG OF THE THREAT
ASSOCIATED WITH ACTUAL SHELTER HABITABILITY, AND
(3) THE DESIGN AND EXECUTION OF FOUR 24 HOUR
HABITABILITY STUDIES TO INVESTIGATE THE EFFECTS OF
INCREASED REALISM OF A SHELTER STAY, IN TERMS OF THE
NUMBER AND RANGE OF PROBLEMS PRESENTED TO THE
SHELTEREES AND THE REALISTIC REPRESENTATION OF OTHER
ASPECTS OF THE EXPECTED SHELTER ENVIRONMENT UNDER THE
CONDITION OF NUCLEAR ATTACK. RESULTS OF THESE
EFFORTS INDICATED THAT (1) THE CONTINGENCY GAME
IS A MEANINGFUL AND FEASIBLE TECHNIQUE BY WHICH TO
EXPLORE PROBLEMS OF LARGE SHELTER MANAGEMENT; (2)
THE CONDITION OF BEING UNDERWATER APPEARED TO PRODUCE
ANXIETY WHICH WAS REFLECTED IN PART BY MARKED
ATTENTIVENESS TO ATMOSPHERIC MONITORING TASKS IN THE
SHELTER, AN ATTENTIVENESS THAT APPEARED TO BE GREATER
THAN THAT EXHIBITED TO THE ANALOGOUS TASK OF
RADIOLOGICAL MONITORING IN THE SHELTER STUDIES; AND
(3) SOME KNOWLEDGE OF THE CONCEPT OF DUAL-PURPOSE
SHELTERS IS DESIRABLE ON THE PART OF THE PUBLIC;
EBS PROGRAMMING SHOULD BE CONTINUOUS. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-645 552 13/13 18/6
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
EXPERIMENTAL AND CALCULATED ESTIMATES OF THE
SHIELDING EFFECTIVENESS OF COMPARTMENTED STRUCTURES
EXPOSED TO FALLOUT, (U)
JUL 66 61P SHUMWAY, BRUCE W. I
REPT. NO. USNRDL-TR-1045

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RESEARCH SPONSORED IN PART BY
OCD.

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHIELDING);
(*STRUCTURES, *SHIELDING), FALLOUT SHELTERS,
CIVIL DEFENSE SYSTEMS, WALLS, PROTECTION,
NUMERICAL ANALYSIS, FLOORS, EFFECTIVENESS (U)

EXPOSURE REDUCTION FACTORS WERE MEASURED INSIDE SIX
COMPARTMENTED STEEL STRUCTURES HAVING DIFFERENT WALL
THICKNESSES RANGING FROM 1/4 TO 1-1/2 IN. THESE
WERE EXPOSED TO RADIATION FROM FALLOUT OF VARYING AGE
FROM THREE TO NINE DAYS. CALCULATIONS BASED UPON
THE NELMS-COOPER GAMMA-RAY SPECTRUM AT H = 1.12
HOURS WERE MADE FOR SELECTED COMPARTMENTS IN EACH OF
THE STRUCTURES FOLLOWING PROCEDURES GIVEN IN THE
OFFICE OF CIVIL DEFENSE PROFESSIONAL
MANUAL, PM-100-1. COMPARISON OF EXPERIMENT AND
CALCULATION REVEALS A SENSITIVITY TO SPECTRAL CHANGES
AND SHOWS THAT PROTECTION IS GREATER DURING THE
PERIODS D = 3 TO D = 9 DAYS THAN AT H = 1.12
HOURS. OVERALL AGREEMENT IS GENERALLY
SATISFACTORY. THE CALCULATIONAL METHODS FOR
RADIATION THROUGH FLOORS, HOWEVER, APPEAR TO BE
INADEQUATE. SPECTRA MEASURED ON SITE AT D = 3 AND
D = 9 DAYS ARE GIVEN. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-846 847 13/12 15/3
HAYES SEAY MATTERN AND MATTERN ROANOKE VA
METHODS OF SHELTER COST ANALYSIS, (U)
DESCRIPTIVE NOTE: FINAL REPT.,
FEB 67 168P BARKSDALE, BYRD H. ;
WADE, SAMUEL R. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, COSTS); DATA
PROCESSING SYSTEMS, STANDARDS, DESIGN,
CONSTRUCTION MATERIALS, LIGHTING EQUIPMENT,
COOLING & VENTILATING EQUIPMENT, LABOR,
MAINTENANCE, CONSTRUCTION, BUILDINGS, CIVIL
DEFENSE SYSTEMS (U)

THE REPORT PRESENTS THE RESULTS OF AN EXAMINATION
OF COMPUTER METHODS OF DETERMINING IMMEDIATE AND
LONG-TERM TOTAL COST OF SHELTER INCORPORATED WITHIN A
BUILDING AT A PRELIMINARY DESIGN STAGE. ALL COST
ITEMS COMPRISING TOTAL COST WERE INVESTIGATED AND
ANALYZED. THIS STUDY CONCLUDED THAT MANY OF THE
ITEMS COMPRISING LONG-TERM TOTAL COST WERE
INDETERMINATE TO SUCH A DEGREE THAT COMPUTER METHODS
OF ANALYSIS WOULD NOT PRODUCE DEFENSIBLE ESTIMATES.
TO DEVELOP A METHOD OF SHELTER COST ANALYSIS, AT A
PRELIMINARY DESIGN STAGE, WILL REQUIRE DEVELOPMENT OF
STANDARDS AND DESIGN LOGIC TO ANALYZE THE EFFECTS OF
CHANGES IN BUILDING GEOMETRY AND COMPONENTS TO
PROVIDE PROTECTION AGAINST EFFECTS OF NUCLEAR
WEAPONS. THESE FACTORS, WHICH MAY BE IDENTIFIED,
INFLUENCE COSTS AND A PROGRAM MAY BE DEVELOPED TO
ACCOUNT FOR THE FACTORS IN PRODUCING ESTIMATES.
ONCE THIS DATA IS DEVELOPED, AND WITH THE
APPLICATION OF AN IN-PLACE UNIT METHOD OF
COST ESTIMATING, REALISTIC IMMEDIATE ALTERNATIVE
SHELTER COST ESTIMATES MAY BE PRODUCED. IT IS
BELIEVED THAT DEVELOPMENT AND IMPLEMENTATION OF THESE
TECHNIQUES WOULD MAKE IT PRACTICAL TO QUICKLY ASSESS
PROTECTION FACTORS AND THE IMPACT OF COST OF CHANGES
IN GEOMETRY, MASS, APERTURE, LIGHTING AND
VENTILATION. PROBABLY ONE OF THE MOST USEFUL
APPLICATIONS WOULD BE IN SENSITIVITY ANALYSIS OF
SEVERAL ALTERNATIVES TO DETERMINE OPTIMUM SHELTER
COST. (AUTHOR) (U)

UNCLASSIFIED

RDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-648 319 5/11 15/3 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA SOCIAL
SYSTEMS PROGRAM
PUBLIC INFORMATION AND KNOWLEDGE REQUISITES OF A
SHELTER SYSTEM. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
SEP 66 156P BEND, EMIL ; COHEN, SUSAN ;
MCDANIEL, CLYDE ;
REPT. NO: AIR-D-93D-9/66-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, CIVIL DEFENSE
SYSTEMS), (*CIVIL DEFENSE SYSTEMS, *PUBLIC
OPINION), SAMPLING, EDUCATION, CIVILIAN
PERSONNEL (U)

THIS STUDY OF PUBLIC INFORMATION REQUIREMENTS FOR
EFFECTIVE USE OF THE SHELTER SYSTEM IS COMPRISED OF
THREE SEPARATE BUT RELATED PARTS. THE FIRST IS AN
ANALYSIS OF THE TYPES OF ITEMS THAT MAKE UP THE
MINIMUM REQUIRED PUBLIC INFORMATION CONTENT FOR
EFFECTIVE SHELTER SYSTEM USE. PUBLIC INFORMATION
IN REGARD TO THREAT WARNING, SHELTER-TAKING, AND IN-
SHELTER SURVIVAL IS DISCUSSED. THE AUDIENCE FOR
SHELTER INFORMATION, THE TIMING OF SHELTER
INFORMATION CAMPAIGNS, AND THE MEDIA FOR PUBLIC
INFORMATION ARE ALSO DISCUSSED. THE SECOND PART OF
THE REPORT CONSISTS OF A DESCRIPTION OF A SHELTER
INFORMATION STUDY, IN WHICH 278 VOLUNTEERS FOR AIR
SHELTER RESEARCH PROJECTS WERE INTERROGATED ON THE
NATURE AND EXTENT OF THEIR INFORMATION AND
MISINFORMATION ABOUT SHELTER-RELATED SUBJECT MATTER.
QUESTIONS WERE ASKED ABOUT KNOWLEDGE OF WARNING
SIGNALS, EMERGENCY COMMUNICATIONS, SHELTERS AND
SHELTER SUPPLIES, FALLOUT AND ITS EFFECTS. THE
LAST SECTION OF THE REPORT CONTAINS THE RESULTS OF A
CONTENT ANALYSIS TO THE PUBLIC BETWEEN 1959 AND THE
PRESENT TIME. THE PURPOSE OF THE ANALYSIS WAS TO
DISCOVER THE EMPHASES AND TRENDS IN THE SHELTER-
RELATED GUIDANCE THAT THE GOVERNMENT HAS MADE
AVAILABLE TO THE PUBLIC. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-648 363 10/2 13/13 13/1
OAK RIDGE NATIONAL LAB TENN
A SURVEY OF UNDERGROUND UTILITY TUNNEL PRACTICE, (U)
FEB 67 110P BOEGLY, W. J., JR.
GRIFFITH, W. L. ;
REPT. NO. ORNL-TN-1714
CONTRACT: W-7405-ENG-26

UNCLASSIFIED REPORT

DESCRIPTORS: (*UNDERGROUND STRUCTURES,
REVIEWS), (*FALLOUT SHELTERS, UNDERGROUND
STRUCTURES), (*URBAN PLANNING, UNDERGROUND
STRUCTURES), MILITARY FACILITIES, URBAN AREAS,
UNIVERSITIES, CIVIL DEFENSE SYSTEMS, FEASIBILITY
STUDIES, HEATING, COOLING, WATER SUPPLIES,
FUELS, POWER SUPPLIES, COMMUNICATION SYSTEMS (U)
IDENTIFIERS: PUBLIC UTILITIES, TUNNELS (U)

A SURVEY HAS BEEN CONDUCTED ON THE USE OF
UNDERGROUND, WALK-THROUGH TUNNELS FOR UTILITY
SYSTEMS. RESULTS OF THIS SURVEY INDICATE THAT THIS
CONCEPT HAS BEEN SUCCESSFULLY AND EXTENSIVELY
EMPLOYED AT UNIVERSITIES AND GOVERNMENT
INSTALLATIONS BUT IS NOT COMMONLY USED IN CITIES.
THERE APPEARS TO BE NO SET CRITERIA OR DESIGN FOR
UTILITY TUNNELS, AND AN OPTIMIZATION OF THE
PARAMETERS IS NEEDED. SINCE MANY PARALLELS EXIST
BETWEEN INSTITUTIONS AND EXPECTED URBAN RENEWAL
PROJECTS, EXTRAPOLATION OF THE UTILITY TUNNEL CONCEPT
TO THESE PROJECTS APPEARS WORTHWHILE.
MODIFICATIONS TO UTILITY TUNNELS TO INCORPORATE
CIVIL DEFENSE SHELTER SPACE APPEAR POSSIBLE, BUT
FURTHER DESIGN STUDIES ARE REQUIRED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-648 492 13/13 15/3 13/1
FLORIDA UNIV GAINESVILLE ENGINEERING AND INDUSTRIAL
EXPERIMENT STATION
SIMULATED OCCUPANCY SHELTER TESTS CONDUCTED DURING
THE PERIOD OF JULY 5, 1962 THROUGH NOVEMBER 5,
1964.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 66 261P FLANIGAN, FRANK M. ;
MORRISON, CLAYTON A. ; BASS, PHILLIP L. ;
CONTRACT: OCD-OS-62-116

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
STANFORD RESEARCH INST., CALIF.

DESCRIPTORS: (*FALLOUT SHELTERS, ENVIRONMENT),
(*RADIOACTIVE FALLOUT, FALLOUT SHELTERS),
SIMULATION, CIVIL DEFENSE SYSTEMS, UNDERGROUND
STRUCTURES, VENTILATION, HEATING, COOLING,
CONSTRUCTION MATERIALS

(U)

A SERIES OF TESTS USING SIMULATED OCCUPANTS WERE
CONDUCTED ON 24 UNDERGROUND SURVIVAL SHELTERS LOCATED
IN VARIOUS GEOGRAPHICAL AREAS OF THE UNITED
STATES. THE PURPOSE OF THIS TEST PROGRAM WAS TO
EVALUATE CHANGES IN SHELTER ENVIRONMENT BROUGHT ABOUT
BY SHELTER OCCUPANTS. THESE SHELTERS WERE LOADED
WITH SIMULATED OCCUPANTS IN A MANNER SIMILAR TO THE
LOADING ANTICIPATED DURING A NATIONAL EMERGENCY
BROUGHT ABOUT DUE TO RADIOACTIVE FALLOUT AS THE
RESULT OF A NUCLEAR ATTACK. A SECOND OBJECTIVE OF
THIS PROGRAM WAS TO DETERMINE THE MINIMUM AMOUNT OF
MECHANICAL EQUIPMENT NECESSARY TO CONTROL THE SHELTER
ENVIRONMENT TO A LEVEL SUITABLE FOR HUMAN SURVIVAL.
IN ACCORD WITH GUIDELINES ESTABLISHED BY THE
OFFICE OF CIVIL DEFENSE MOST OF THE TEST
SHELTERS WERE LOADED ON THE BASIS OF ONE OCCUPANT PER
TEN SQUARE FEET OF FLOOR AREA. HOWEVER, SPECIAL
SHELTERS SUCH AS THE ST. LOUIS COMMAND CENTER
WERE TESTED AT LOWER LOADINGS AND DURING THE COURSE
OF THE PROGRAM OTHER SHELTER LOADINGS WERE USED TO
INVESTIGATE THE EFFECT OF SHELTER LOADING ON THE
ENVIRONMENT WITHIN THE SHELTER. VENTILATION AIR
WAS CONDITIONED TO CONFORM TO TYPICAL VALUES OF
EFFECTIVE TEMPERATURE FOR THE TEST LOCALE.
SHELTERS WERE TESTED UNDER SIMULATED SUMMER AND
WINTER CLIMATIC CONDITIONS. SIMULATED OCCUPANTS
WERE USED AND ADJUSTED SO AS TO RELEASE SENSIBLE AND
LATENT HEAT TO THE SHELTER ATMOSPHERE IN QUANTITIES
EQUIVALENT TO THOSE THAT WOULD BE RELEASED BY HUMAN
OCCUPANTS.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-648 870 13/13 5/1 10/3
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA SOC:AL
SYSTEMS PROGRAM
RESEARCH DATA FROM SHELTER OCCUPANCY EXERCISES. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
DEC 66 143P COLLINS, ROBERT A. ;
BEND, EMIL ;
REPT. NO. AIR-D66-12/66-FR
CONTRACT: OCD-OS-63-97
PROJ: 1517A

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, CIVIL DEFENSE
SYSTEMS), (*MANAGEMENT ENGINEERING, FALLOUT
SHELTERS), STUDENTS, INSTRUCTORS,
QUESTIONNAIRES, PROGRAMMING (COMPUTERS),
INFORMATION RETRIEVAL, DATA STORAGE SYSTEMS (U)

THE PURPOSE OF THIS PROJECT WAS TO COLLECT AND
ANALYZE HABITABILITY DATA FROM CIVIL DEFENSE
UNIVERSITY EXTENSION PROGRAM (CDUEP) SCHOOL
EXERCISES. AS INITIALLY DEFINED, THE DATA WERE TO
INCLUDE: (1) INFORMATION RELATED TO
EXPERIMENTAL MANIPULATIONS, WHERE INTRODUCED INTO THE
EXERCISES, (2) BACKGROUND INFORMATION ON
PARTICIPATING STUDENTS, AND (3) OTHER DATA
RELATED TO THE OCCUPANCY EXERCISES (SUPPLIES AND
EQUIPMENT, GENERAL FEELINGS ABOUT THE EXPERIENCE, AND
MANAGEMENT DATA). TWO DATA COLLECTION
INSTRUMENTS WERE DEVELOPED, BOTH SELF-ADMINISTERING:
ONE FOR THE STUDENTS AND ONE FOR THE INSTRUCTOR OF
THE COURSE. PROCEDURES WERE DEVELOPED FOR CODING
THIS DATA AND ENTERING CODES ONTO PUNCHED IBM CARDS
FOR LATER TRANSFERENCE TO MAGNETIC TAPE FOR PURPOSES
OF ULTIMATE STORAGE AND ANALYSIS. MARGINAL
DISTRIBUTIONS FOR STUDENT AND INSTRUCTOR
QUESTIONNAIRE DATA ARE EXHIBITED IN TABLE FORM AND
DISCUSSED. SELECTED CROSS TABULATIONS ARE
EXHIBITED AND DISCUSSED. SUGGESTED IDEAS FOR FUTURE
RESEARCH ARE LISTED. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-650 323 13/12 13/13

IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
DEVELOPMENT OF STANDARD FIRE TEST RATING SYSTEMS FOR
SHELTER COMPONENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT., 30 SEP 63-20 FEB 66,
DEC 66 164P LABES, WILLIS G. ;
WATERMAN, THOMAS E. ; VARLEY, REED B. ;
REPT. NO. IITRI-N6061

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *FIRE SAFETY),
(*FIRES, STRUCTURES), SMOKE, BUILDINGS,
CONSTRUCTION, BLAST, RADIOACTIVE FALLOUT, HEAT
TRANSFER, EXPOSURE, TOXICITY, CIVIL DEFENSE
SYSTEMS, CONSTRUCTION MATERIALS (U)

IN THIS STUDY FIRE TESTS FOR THE PURPOSE OF RATING
STRUCTURAL COMPONENTS OF BLAST SHELTERS AND FALLOUT
SHELTERS ARE CONSIDERED. EXISTING FIRE TEST
PROCEDURES FOR BUILDING CONSTRUCTION AND MATERIALS,
DOOR ASSEMBLIES, AND WINDOW ASSEMBLIES ARE ANALYZED
TO DETERMINE HOW RESULTS FROM THESE TESTS MAY BE
APPLIED TOWARD THE DEVELOPMENT OF A SYSTEM FOR RATING
SHELTER COMPONENTS. SHELTER COMPONENT PERFORMANCE
REQUIREMENTS IN REGARD TO HEAT TRANSMISSION, SMOKE
AND TOXIC GAS BUILD-UP IN SHELTER AREAS, AND FIRE
SPREAD AND STRUCTURAL COLLAPSE ARE DESCRIBED. FIRE
EXPOSURES FOR THE RATING OF SHELTER COMPONENTS ARE
DESCRIBED AND CLASSIFIED ACCORDING TO THEIR
CHARACTERISTIC MODES OF HEAT TRANSFER. THE SOURCES
OF THESE EXPOSURES, DESCRIBED AS EXPOSURES FROM FIRE
WITHIN THE SHELTER BUILDING, FROM FIRE IN INDIVIDUAL
NEARBY BUILDINGS, FROM MASS FIRE, AND FROM DEBRIS
FIRE, ARE ANALYZED AND INTERIM DATA PRESENTED ON
EXPOSURE SEVERITY. A USEFUL CONCEPT FOR THE
COMPARISON OF FIRE EXPOSURES, BASED UPON THEIR
EFFECTS ON EACH TYPE OF COMPONENT, IS DEFINED. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-650 930 15/3

RESEARCH TRIANGLE INST DURHAM N C OPERATIONS RESEARCH AND
ECONOMICS DIV

PROTECTION ANALYSIS AND CONSTRUCTION EVALUATION
SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL REPT., 13 JAN 65-15 JAN 66.

JAN 66 31P BRYAN, F. A., JR.

HILL, E. L.; HOWARD, B. W.; JOHNSON, T. J.

LYDAY, R. O. J.

REPT. NO. RTI-R-00-205

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *COMPUTER
PROGRAMS), CIVIL DEFENSE SYSTEMS, PROTECTION,
RADIOACTIVE FALLOUT, STRUCTURES, COMPUTERS,
ANALYSIS, DESIGN

(U)

THE TASK ASSIGNMENTS IN THIS PROJECT WERE
PRINCIPALLY CONCERNED WITH THE IMPLEMENTATION OF A
CDC-3600 COMPUTER PROGRAM FOR COMPUTING PF'S OF
STRUCTURES (PF-COMP) AS WELL AS WITH ADDITIONS TO
THE PROGRAM WHICH WOULD MAKE IT MORE USEFUL TO
ARCHITECTS AND ENGINEERS. THE PROGRAM WAS
IMPLEMENTED BY THE RESEARCH TRIANGLE
INSTITUTE (RTI) THROUGH THE OFFICE OF CIVIL
DEFENSE FIRST IN THE PERFORMANCE OF THE MILITARY
OVERSEAS SHELTER SURVEY (MOSS) AND
SUBSEQUENTLY IN THE ANALYSIS OF FEDERAL BUILDINGS
DESIGNATED BY THE OFFICE OF CIVIL DEFENSE.
FINALLY, IMPLEMENTATION OF THE COMPUTER PROGRAM AS
A SERVICE TO QUALIFIED FALLOUT SHELTER ANALYSTS WAS
PERFORMED IN THE SHELTER ANALYSIS FOR NEW
DESIGNS (SAND) PROGRAM. A PRINCIPAL ADDITION
TO THE PF-COMP COMPUTER PROGRAM WHICH WILL RENDER
IT MORE USEFUL TO ARCHITECTS AND ENGINEERS CONSISTED
OF AN ANALYTICAL ROUTINE FOR COST EFFECTIVENESS
MODIFICATION OF STRUCTURES TO IMPROVE BASEMENT
SHELTER PF. INCORPORATED AS A SUBROUTINE IN THIS
SUPPLEMENTARY PROGRAM IS A TECHNIQUE WHICH PERMITS
DEFINITION OF SHELTER BOUNDARY AS A FUNCTION ONLY OF
PERCENTAGE ROOF CONTRIBUTION AND SHELTER LOCATION
WITHIN A STRUCTURE. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML47

AD-651 167 15/3
PITTSBURGH UNIV PA DEPT OF SOCIOLOGY
COST AND FINANCING OF CIVIL DEFENSES, SOME PUBLIC
VIEWS. (U)
FEB 67 77P COLEMAN, ALAN N. ;
CONTRACT: DAHC20-67-C-0122, NSF G11309

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
ECONOMICS); COSTS, FALLOUT SHELTERS, PUBLIC
OPINION (U)

THE REPORT ATTEMPTS TO BRING TOGETHER, FROM
NUMBER OF NATIONAL AND COMMUNITY STUDIES, THE RESULTS
REGARDING THE AMERICAN PUBLIC'S VIEW ON THE COST
AND FINANCING OF CIVIL DEFENSE MEASURES AND PROGRAMS.
GIVEN THE LIMITATIONS IMPOSED BY THE NUMBER AND
DIVERSITY OF THE STUDIES USED, THE FOLLOWING
GENERALIZATIONS OBTAINED: (1) INCREASING CIVIL
DEFENSE EXPENDITURES IN GENERAL IS BELIEVED
DESIRABLE; (2) MANY CITIZENS ARE UNCERTAIN ABOUT
WHAT FALLOUT PROTECTION SHOULD COST; (3) PERSONAL
ASSUMPTION OF THE TOTAL OR EVEN PARTIAL COST FOR
FAMILY SHELTERS IS NOT FAVORED; (4) MAJOR
OBJECTIONS TO FAMILY FALLOUT SHELTER INVOLVE COST;
(5) FAVORABILITY OF PUBLIC AS WELL AS FAMILY
FALLOUT SHELTERS IS INCREASED WHEN FEDERAL OR STATE
FINANCIAL ASSISTANCE IS INCLUDED; (6) A
SUBSTANTIAL PORTION OF THE CITIZENRY FAVORS A TAX
REDUCTION OR EXEMPTION FOR SHELTERS; (7) INDIRECT
INDUCEMENTS FOR BUILDING SHELTERS GENERALLY MEET THE
APPROVAL OF THE PUBLIC; (8) SPECIFIED ALTERNATIVE
METHODS OF FINANCING SHELTERS HAVE BEEN MET WITH
DISAPPROVAL OR UNCERTAINTY; (9) PUBLIC SHELTERS
ARE VIEWED AS EFFECTIVE AND WORTH THE COST; (10)
AMONG ALTERNATIVE PROGRAMS, EDUCATION AND HEALTH RANK
AHEAD OF CIVIL DEFENSE MEASURES, AND VERY FEW PEOPLE
CURRENTLY AGREE THAT CIVIL DEFENSE MONIES WOULD BE
BETTER SPENT ON MISSILES AND BOMBERS. THE MAJORITY
OF THE STUDIES UTILIZED WERE CONDUCTED IN THE EARLY
1960'S--A TIME WHEN THE FAMILY SHELTER CONTROVERSY
REACHED IT APEX. GENERAL COST AND FINANCING ISSUES
AND ALTERNATIVES HAVE NOT BEEN PROBED EXTENSIVELY IN
NATIONAL AND COMMUNITY SURVEYS. (AUTHOR) (U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-65: 182 13/13

OFFICE OF CIVIL DEFENSE WASHINGTON D C
BUILDINGS WITH FALLOUT SHELTER.

(U)

JUL 66 57P

REPT. NO. OCD-TR-37

UNCLASSIFIED REPORT

AVAILABILITY: HARD COPY AVAILABLE FROM USA
PUBLICATION CENTER, CIVIL DEFENSE BRANCH, 2600
EASTERN BLVD. (MIDDLE RIVER), BALTIMORE, MD.
21220.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
DEPARTMENT OF DEFENSE, WASHINGTON, D. C.

DESCRIPTORS: (*FALLOUT SHELTERS, *CIVIL DEFENSE
SYSTEMS), (*BUILDINGS, SHIELDING), NUCLEAR
EXPLOSION DAMAGE, NUCLEAR RADIATION, CONSTRUCTION,
COSTS, NUCLEAR WARFARE

(U)

THE BOOKLET CONTAINS DESCRIPTIONS, PHOTOGRAPHS,
DRAWINGS AND COST ANALYSES OF VARIOUS TYPES OF NEW
BUILDINGS WITH BUILT-IN FALLOUT PROTECTION.
ARCHITECTS AND ENGINEERS KNOWLEDGEABLE IN SHIELDING
TECHNIQUES CAN INCORPORATE THE ADDITIONAL FALLOUT
PROTECTION FOR LITTLE, IF ANY, INCREASE IN COST,
WHETHER THE BUILDING IS A SCHOOL, BANK, LIBRARY,
CHURCH, DORMITORY, OFFICE BUILDING, INDUSTRIAL
FACILITY OR HOME FOR THE AGED. THE SHIELDING
TECHNIQUES ARE APPLICABLE TO ALL TYPES OF BUILDINGS.
THE PROJECTS SHOWN HERE ARE ATTRACTIVE AND CONTAIN
FALLOUT SHELTER IN ABOVEGROUND AS WELL AS BELOWGROUND
LOCATIONS. THE SHELTER AREAS ARE IN CONTINUOUS USE
AS PART OF THE NORMAL BUILDING FUNCTION AND HAVE BEEN
PROVIDED WITHOUT ADVERSELY AFFECTING THE COST OR
APPEARANCE.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BHL27

AD-651 805 13/13 15/3

HUDSON INST INC HARMON-ON-HUDSON N Y
ON THE DESIGN OF RISK-ORIENTED, LOW COST FALLOUT
SHELTER SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

MAR 67 39P ROCKETT, FREDERICK C. ;
BROWN, WILLIAM M. ;
REPT. NO. HI-486/3-RR

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *DESIGN),
(*CIVIL DEFENSE SYSTEMS, *COSTS), RADIOACTIVE
FALLOUT, SURVIVAL, COMPUTERS, VULNERABILITY,
EVACUATION, UNDERGROUND STRUCTURES, MILITARY
STRATEGY, RADIATION EFFECTS, HOUSING, RADIATION
TOLERANCE, URBAN AREAS, TABLES, RURAL AREAS,
UNITED STATES (U)

THE PAPER ARGUES THAT FOR EACH OF A SPECTRUM OF
INTERESTING ATTACKS, CALCULATIONS OF MINIMUM
REQUIRED FALLOUT PROTECTION WHICH WOULD ASSURE HIGH
SURVIVAL PROBABILITIES CAN BE MADE FOR EACH U. S.
COMMUNITY. SUCH CALCULATIONS WOULD PROVIDE A BASIS
FOR LOCAL CD PLANNING TO REDUCE THE VULNERABILITY
TO FALLOUT. IF THE CD PROGRAM COMBINED THIS
BALANCED FALLOUT PROTECTION WITH EMERGENCY
EVACUATION FROM THE MORE VULNERABLE AREAS, THEN THE
SURVIVAL POTENTIAL COULD BECOME VERY GREAT IN
SITUATIONS WHICH OFFERED A FEW DAYS OR MORE OF
STRATEGIC WARNING. THE SHELTER RESOURCES IN THE
U. S. AND THEIR POTENTIAL FOR SUCH A CD PROGRAM
ARE ANALYSED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-651 944 6/8 15/3
STANFORD RESEARCH INST MENLO PARK CALIF
ACCEPTABILITY OF SHELTER RATIONS IN COMBINATION WITH
ADJUNCTS. (U)
DESCRIPTIVE NOTE: INTERIM REPT., APR 66-FEB 67,
MAR 67 16P STONE, HERBERT ;
OLIVER, SHIRLEY M. ; SINGLETON, RICHARD C. ;
PROJ: SKI-4949-500

UNCLASSIFIED REPORT

DESCRIPTORS: (*FOOD, *ACCEPTABILITY), FALLOUT
SHELTERS, TASTE, CIVIL DEFENSE SYSTEMS, FRUITS,
CONDIMENTS, SUCROSE, FOOD DISPENSING,
TESTS (U)

IMPROVEMENT IN RATION ACCEPTABILITY WAS APPROACHED
THROUGH THE USE OF ADJUNCTS (FLAVORED SPREADS) IN
COMBINATION WITH THE RATIONS. OF THE 14 ADJUNCTS
TESTED, ONLY 8 WERE FOUND TO BE PREFERABLE TO THE
RATION ALONE WHEN TASTED IN A PAIRED-COMPARISON TEST.
THE THREE ADJUNCTS RECEIVING THE HIGHEST SCORES
(STRAWBERRY JELLY, WILD CHERRY JELLY, AND LEMON
JELLY) SHOULD BE CONSIDERED FOR STORAGE IN CIVIL
DEFENSE SHELTERS. THESE RESULTS WERE BASED ON
EXPERIMENTS INVOLVING 12 SUBJECTS FOR EACH OF THE 42
ADJUNCT-RATION COMBINATIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-653 018 13/13 15/3
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
PSYCHOLOGICAL, ENGINEERING, AND PHYSIOLOGICAL
EVALUATION OF SHELTER EQUIPMENT AND PROCEDURES.
VOLUME I. SUMMARY AND REVIEW. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
FEB 67 35P MEIER, H. A. JENGHOLM, G. ;
REPT. NO. GARD-1292-VOL-1
PROJ: 1522A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME II - AD-653 019;
VOLUME III - AD-653 020.

DESCRIPTORS: (*FALLOUT SHELTERS, *CIVIL DEFENSE
SYSTEMS), SYSTEMS ENGINEERING, VENTILATION,
COOLING, MANAGEMENT ENGINEERING, INSTRUCTION
MANUALS, PHYSIOLOGY, PSYCHOLOGY, FOOD, WATER
SUPPLIES, TOILET FACILITIES, STRESSES (U)

A SERIES OF NON-OCCUPANCY AND SHELTER OCCUPANCY
STUDIES WERE CONDUCTED WHICH EVALUATED THE ABILITY OF
TYPICAL SHELTEREES TO USE (1) A PACKAGE
VENTILATION KIT (PVK), (2) THREE TYPES OF
EFFECTIVE TEMPERATURE METERS, (3) A TOXIC GAS
DETECTOR, AND (4) A PROTOTYPE DRINKING WATER
DISPENSER; AND TO EVALUATE THE ABILITY OF THIS
EQUIPMENT TO INTEGRATE INTO THE SHELTER SYSTEM.
THE SHELTEREES CAN ASSEMBLE THE PVK BUT CANNOT
DEPLOY IT CORRECTLY UNLESS THEY ARE SUPPLIED WITH
DETAILED PHOTOGRAPH-FLOOR PLAN INSTRUCTIONS. THE
PVK'S IMPACT ON THE SHELTER SYSTEM IS MINIMAL.
AT A LOW WATER LEVEL, THE WATER DISPENSER PROVED
AWKWARD. THE TOXIC GAS DETECTOR IS NOT EASILY
OPERATED AND THE EFFECTIVE TEMPERATURE METERS ARE
GENERALLY READ IN ERROR. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-653 019 13/13 15/3
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
PSYCHOLOGICAL, ENGINEERING, AND PHYSIOLOGICAL
EVALUATION OF SHELTER EQUIPMENT AND PROCEDURES.
VOLUME II. LABORATORY STUDIES. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
FEB 67 154P HALE, J. F. ; BEHL, M. F.

REPT. NO. GARD-1292-VOL-2
PROJ: 1522A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: DOCUMENT CONTAINS COLOR, REPRODUCTION
IN B/W ONLY. SEE ALSO VOLUME I - AD-653 018;
VOLUME III - AD-653 020.

DESCRIPTORS: (*FALLOUT SHELTERS, *CIVIL DEFENSE
SYSTEMS), SYSTEMS ENGINEERING, COOLING,
VENTILATION, MANAGEMENT ENGINEERING, INSTRUCTION
MANUALS, PHYSIOLOGY, PSYCHOLOGY, WATER
SUPPLIES (U)

TWO SERIES OF NON-OCCUPANCY TESTS EXAMINED THE
EFFECTIVENESS OF VARIOUS KINDS OF INSTRUCTIONS
DESIGNED TO SUPPORT THE USE OF (1) A PACKAGE
VENTILATION KIT (PVK), (2) THREE TYPES OF
EFFECTIVE TEMPERATURE (ET) METERS, (3) A
TOXIC GAS DETECTOR, AND (4) THE OGD WATER
DISPENSER BY PERSONS UNFAMILIAR WITH THESE DEVICES.
IN THE FIRST STUDY, SUBJECTS WERE ABLE TO ASSEMBLE
THE PVK BUT UNABLE TO DEPLOY IT CORRECTLY. THE
ET METERS WERE GENERALLY READ IN ERROR. AT A LOW
WATER LEVEL, THE WATER DISPENSER WAS NOT USED
PROPERLY. IN THE SECOND STUDY, SUBJECTS WERE ABLE
TO DEPLOY THE PVK USING PHOTOGRAPH-FLOOR PLAN
INSTRUCTIONS. PREFABRICATED DUCTWORK REDUCED THE
INSTALLATION TIME, BUT PROBLEMS WITH TWISTING OF THE
DUCT OCCURRED. A PVK INSTRUCTION MANUAL IS
PRESENTED WHICH EMPLOYS THE RESULTS OF BOTH TEST
SERIES. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-653 020 13/13 15/3
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
PSYCHOLOGICAL, ENGINEERING, AND PHYSIOLOGICAL
EVALUATION OF SHELTER EQUIPMENT AND PROCEDURES.
VOLUME III. HABITABILITY STUDIES. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
FEB 67 222P SMITH, R. W. MADSON, C.
A. ;
REPT. NO. GARD-1292-VOL-3
PROJ: 1522A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME I - AD-653 0181
VOLUME II - AD-653 019.

DESCRIPTORS: (*FALLOUT SHELTERS, *CIVIL DEFENSE
SYSTEMS), SYSTEMS ENGINEERING, COOLING,
VENTILATION, MANAGEMENT ENGINEERING, INSTRUCTION
MANUALS, PHYSIOLOGY, PSYCHOLOGY, WATER
SUPPLIES (U)

THREE SHELTER HABITABILITY TESTS EXAMINED THE
EFFECTIVENESS OF INSTRUCTIONS AND JOB AIDS DESIGNED
TO SUPPORT THE USE OF (1) A PACKAGE
VENTILATION KIT, (2) EFFECTIVE
TEMPERATURE METERS, (3) A TOXIC GAS DETECTOR,
(4) THE OGD WATER DISPENSER, (5) AND OTHER
SHELTER EQUIPMENT BY UNTRAINED SUBJECTS AND THE
EFFECT OF THESE EQUIPMENTS ON THE SHELTER
ORGANIZATION AND MANAGEMENT. OTHER FACTORS RELATED
TO SHELTER OCCUPANCY ARE ALSO DISCUSSED, SUCH AS ROLE
CONFLICT AND DEFECTIONS. RECOMMENDATIONS ARE GIVEN
FOR IMPROVEMENT IN THE INSTRUCTIONS, DEVICES, AND
SHELTER MANAGEMENT. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-653 475

18/8

OFFICE OF CIVIL DEFENSE WASHINGTON D C POSTATTACK RESEARCH
DIV

FALLOUT RADIATION EXPOSURE CONTROL PLAN

INTRODUCTION.

65

53P

GREENE, JACK C. ;

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIOACTIVE FALLOUT, *CONTROL).

EXPOSURE, FALLOUT SHELTERS, CONTAMINATION,
SOLUBILITY, RADIOACTIVITY, WATER SUPPLIES,
CIVIL DEFENSE SYSTEMS, FOOD, INTENSITY,
RADIOACTIVE DECAY, EFFECTIVENESS, PHYSICAL
PROPERTIES, TESTS, PROTECTION

(U)

THE PAPER IS INTENDED FOR USE BY POSTATTACK
RESEARCH CONTRACTORS AND OTHER INTERESTED PERSONS AS
A SUMMARY STATEMENT ON THE PROBLEMS OF RADIATION
EXPOSURE CONTROL WITH EMPHASIS ON THE PERIOD AFTER
PEOPLE EMERGE FROM SHELTER. THIS PAPER IS THE
FIRST OF ITS KIND ON THE SUBJECT AND, FOR THIS
REASON, CERTAIN BACKGROUND MATERIAL IS INCLUDED.
AN EFFORT IS MADE TO IDENTIFY AND DISCUSS PROBLEMS
IN SIMPLE AND DIRECT LANGUAGE, AND TO RELATE TO
OPERATIONAL SITUATIONS. LOSS OF PRECISION THAT
RESULTS THEREBY IS NOT LIKELY TO CHANGE THE
IMPLICATIONS AND CONCLUSIONS IN ANY IMPORTANT WAY.
REFERENCES LISTED AT THE END OF THE PAPER CONTAIN
THE UP-TO-DATE SCIENTIFIC INFORMATION ON THIS
SUBJECT; ALSO, FOOTNOTES ARE USED IN SOME CASES TO
PROVIDE SUPPLEMENTAL INFORMATION.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-653 879 15/3 5/1 13/13
GEORGIA UNIV ATHENS CIVIL DEFENSE RESEARCH
SHELTER OCCUPANCY STUDIES-UNIVERSITY OF GEORGIA
(1966). VOLUME II. COMMUNITY FALLOUT SHELTER
HANDBOOK FOR UNTRAINED MANAGEMENT. (U)
DESCRIPTIVE NOTE: ED. NO. 7,
DEC 66 147P HAMMES, JOHN A. ;
AHEARN, THOMAS R. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONTINUATION OF CONTRACT OCD-PS-
65-45. SEE ALSO VOLUME I, AD-653 881.

DESCRIPTORS: (•FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), HANDBOOKS, INSTRUCTION MANUALS,
LEADERSHIP, CIVIL DEFENSE SYSTEMS, TRAINING,
CIVIL DEFENSE PERSONNEL, MEDICAL SUPPLIES,
CONFINED ENVIRONMENTS, NUTRITION, RECREATION,
SANITARY ENGINEERING, MEDICAL EXAMINATION (U)

AN INSTRUCTION MANUAL IS PRESENTED FOR TEMPORARY
SHELTER MANAGERS. A HANDBOOK FOR PERMANENT SHELTER
MANAGERS IS ALSO INCLUDED. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-653 881 15/3 5/1 13/13
GEORGIA UNIV ATHENS CIVIL DEFENSE RESEARCH
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA (1966), VOLUME I. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
DEC 66 403P HAMMES, JOHN A. ;
AHEARN, THOMAS R. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONTINUATION OF CONTRACT OCD-PS-
65-45. SEE ALSO VOLUME 2, AD-653 879.

DESCRIPTORS: (FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), EXPERIMENTAL DESIGN, LEADERSHIP,
CIVIL DEFENSE SYSTEMS, TRAINING, CIVIL DEFENSE
PERSONNEL, MEDICAL SUPPLIES, CONFINED
ENVIRONMENTS, SANITARY ENGINEERING, NUTRITION,
MEDICAL EXAMINATION, PERSONALITY TESTS, TOILET
FACILITIES, RECREATION, HANDBOOKS (U)

IN THE PERIOD 1962-66, THE CIVIL DEFENSE
RESEARCH STAFF AT THE UNIVERSITY OF GEORGIA HAS
CONDUCTED TEN SIMULATED FALLOUT SHELTER OCCUPANCY
STUDIES. THESE TESTS INVOLVED HEALTHY MEN, WOMEN,
AND CHILDREN, NINE MONTHS THROUGH SEVENTY-THREE YEARS
OF AGE, IN GROUPS OF THIRTY TO FIVE HUNDRED PERSONS,
CONFINED FOR PERIODS OF TWO DAYS TO TWO WEEKS UNDER
RATHER AUSTERE SHELTER CONDITIONS. DETAILED
FINDINGS OF THESE OCCUPANCY TESTS HAVE BEEN PRESENTED
IN PREVIOUS ANNUAL REPORTS. THE PRESENT REPORT
CONTAINS FINDINGS OF THE 1966 OCCUPANCY TESTS, AS
WELL AS A SYNTHESIS OF ALL STUDIES TO DATE, AND THE
IMPLICATIONS FOR RESEARCH IN THE NATIONAL SHELTER
PROGRAM. A RESEARCH PROTOTYPE COMMUNITY
SHELTER HANDBOOK FOR UNTRAINED MANAGEMENT IS
INCLUDED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-654 478 15/3

HUDSON INST INC HARMON-ON-HUDSON N Y
CRISIS CIVIL DEFENSE AND DETERRENCE,
APR 67 85P ROCKETT, FREDERICK C. :
REPT. NO. HI-777/2-RR

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, *USSR),
(*EASTERN EUROPE, CIVIL DEFENSE SYSTEMS),
(*CHINA, CIVIL DEFENSE SYSTEMS), DETERRENCE,
NATIONAL DEFENSE, UNITED STATES,
TRANSPORTATION, EVACUATION, URBAN AREAS,
FALLOUT SHELTERS, SURVIVAL, INDUSTRIES,
VULNERABILITY, RECOVERY

(U)

THE REPORT EXAMINES THE POTENTIAL OF THE SOVIET UNION, CHINA, AND SOME EUROPEAN NATIONS FOR REDUCING THEIR VULNERABILITY TO NUCLEAR ATTACK THROUGH EMERGENCY CIVIL DEFENSE MEASURES TAKEN DURING AN INTENSE CRISIS. IT IS ARGUED THAT THIS CD POTENTIAL BY SUBSTANTIALLY REDUCING THE NUMBER OF HOSTAGES AND PROVIDING AN IMPROVED RECOVERY CAPABILITY, HAS SOME IMPLICATIONS FOR U.S. DETERRENCE POLICY. THUS, IF DETERRENCE POLICY IS THOUGHT TO REQUIRE A LARGE NUMBER OF URBAN HOSTAGES, IT MAY NEED TO BE REVIEWED IN LIGHT OF THE ABOVE POSSIBILITY. A SURVEY OF THE CD POLICIES AND CAPABILITIES OF THE ABOVE COUNTRIES SUGGESTS THAT A PRIMARY CRISIS CD MEASURE COULD BE AN URBAN EVACUATION TO EXPEDIENT OR IMPROVISED FALLOUT PROTECTION. IN ADDITION, IN SOME CRISIS ENOUGH TIME MIGHT BE AVAILABLE TO MOVE SOME PERSONAL PROPERTY AND PERHAPS SOME CRITICAL INDUSTRIAL RESOURCES OUT OF THE MORE LIKELY TARGET AREAS.

(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-655 270 5/11 15/3
PITTSBURGH UNIV PA DEPT OF SOCIOLOGY
SHELTER ASSIGNMENT CONCEPT: A STUDY IN PUBLIC
ACCEPTANCE,
APR 67 104P NEHNEVAUSA, JIRI ;
CONTRACT: DAHC29-67-C-0122

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (FALLOUT SHELTERS, PUBLIC
OPINION), CIVIL DEFENSE SYSTEMS, ACCEPTABILITY,
SOCIOLOGY, ATTITUDES, TABLES

(U)

THE REPORT ELABORATES RESPONSES OF 1,497 NATIONALLY
SAMPLED AMERICANS TO AN ITEM PROBING INTO
DESIRABILITY OF PROVIDING THE NATION WITH ASSIGNED
SHELTERING CLOSE TO HOME AND WORK BY DEMOGRAPHIC,
SOCIO-CULTURAL AND SELECTED ATTITUDINAL
CHARACTERISTICS. THE DATA ARE DRAWN FROM THE 1966
FIELD STUDY. IN THIS MANNER, THE PERSPECTIVES
REGARDING SHELTER ASSIGNMENT ARE EVALUATED BY 87
DEMOGRAPHIC, AND 137 ATTITUDINAL, SUBGROUPS OF OUR
POPULATION. THE FINDINGS INDICATE THAT THE SHELTER
ASSIGNMENT CONCEPT IS QUITE ACCEPTABLE TO THE NATION.
UNFAVORABLE EXPRESSIONS OCCUR WITH LOW FREQUENCIES,
AND ONLY FOUR OF ALL THE SUBGROUPS CONSIDERED
ACTUALLY YIELD A NEGATIVE DESIRABILITY AVERAGE IN
RELATION TO THE QUESTION. OF THESE SUBGROUPS, IN
FACT, THREE REPRESENT RESPONDENTS WHO ASSIGNED
NEGATIVE DESIRABILITY VALUES OF (-1) OR (-2)
OR (-3) ON THE OVERALL SCALE (FROM +3 TO -
3) TO CIVIL DEFENSE EFFORTS IN GENERAL. BY
AND LARGE, AND WITHIN THE OVERALL PATTERN OF
FAVORABLENESS, THE ATTITUDINAL VARIABLES (COLD
WAR, VIETNAM AND SIMILAR FACTORS) DIFFERENTIATE
AMONG THE RESPONDENT SUBGROUPS CONSISTENTLY MORE THAN
DO DEMOGRAPHIC CHARACTERISTICS. IN VIEW OF THE
FACT THAT POSITIVE ASSESSMENTS ACTUALLY EXCEED TWO
THIRDS OF THE RESPONDENTS AND THE CONCEPT DISAPPROVAL
IS NOT TYPICAL OF SPECIFIC SEGMENTS OF OUR
POPULATION, IT IS CONCLUDED THAT SOMETHING OF
NATIONAL CONSENSUS PREVAILS WITH REGARD TO THE
DESIRABILITY OF SHELTER ASSIGNMENT. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD#655 284 15/3
IIT RESEARCH INST CHICAGO ILL
CIVIL DEFENSE SHELTER OPTIONS FOR FALLOUT AND BLAST
PROTECTION (DUAL-PURPOSE). (U)
DESCRIPTIVE NOTE: FINAL REPT. AND SUMMARY MAR 66-NOV
66.
MAY 67 234P LONGINOW, A. I
PROJ: IITRI-M6101

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, *FALLOUT
SHELTERS), RADIOACTIVE FALLOUT, NUCLEAR
EXPLOSION DAMAGE, PROTECTION, DESIGN,
UNDERGROUND EXPLOSIONS, COSTS, UNDERGROUND
STRUCTURES, EFFECTIVENESS, BLAST, MAPS,
ECONOMICS, CONSTRUCTION, TABLES (U)

THE EFFORT REPORTED HEREIN IS CONCERNED WITH
CIVILIAN DUAL-USE PERSONNEL SHELTERS. ITS PRIMARY
OBJECTIVES ARE: TO DETERMINE FOR NUCLEAR WEAPONS
ENVIRONMENTS OTHER THAN FALLOUT RADIATION ALONE, THE
EXTENT OF THE ECONOMIC ADVANTAGES OF DUAL-USE SHELTER
SYSTEMS WITH RESPECT TO EXPECTED PERCENT OF
POPULATION THUS SHELTERED. TO BRING INTO SHARPER
FOCUS THOSE AREAS IN WHICH MORE RESEARCH OR ANALYSIS
IS NECESSARY IN ORDER TO INCREASE THE EFFECTIVENESS
OF THIS SHELTERING CONCEPT. TOPICS SUPPLEMENTARY
TO THE ABOVE OBJECTIVES INCLUDE: ESTIMATED
CONSTRUCTION TRENDS IN SELECTED TYPES OF
CONSTRUCTION, A LIMITED STUDY ON THE USE OF
EXPRESSWAY GRADE SEPARATIONS AS DUAL-USE SHELTERS,
AND COST ESTIMATING AND COST REPORTING AS APPLIED TO
DUAL-USE SHELTERS. RESULTS OF THIS EFFORT DEALING
WITH A LARGE NUMBER OF EXISTING RELATED TOPICS ARE
CONTAINED IN THIS REPORT. THESE RESULTS ARE IN THE
FORM OF ASSEMBLED AND UPDATED COSTS AS WELL AS
PHYSICAL AND ENVIRONMENTAL DATA AND CONCLUSIONS.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-655 519 13/13 18/8 13/3 15/6
HUDSON INST INC HARMON-ON-HUDSON N Y
TIME-COMPRESSION POTENTIAL OF AN EMERGENCY BLAST
SHELTER PROGRAM. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAY 67 94P BROWN, WILLIAM M. ;
CANDELA, BASIN ; CANDLIN, STANTON ; KURPKA, ROBERT
A. ; PANERO, ROBERT ;
REPT. NO. H1-774-RR

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *CONSTRUCTION
MATERIALS), (*RADIOACTIVE FALLOUT, *CIVIL
DEFENSE SYSTEMS), BLAST, SHOCK WAVES, TABLES,
DESIGN, CONSTRUCTION, COSTS, DECISION MAKING,
URBAN PLANNING, URBAN AREAS, NUCLEAR WARFARE,
MOBILIZATION, MANAGEMENT PLANNING, TIME (U)

AN EXAMINATION IS MADE OF THE NATION'S POTENTIAL
FOR VERY RAPID CONSTRUCTION OF AN URBAN BLAST SHELTER
SYSTEM DURING SEVERE NUCLEAR CRISES. ASSUMING THE
EXISTENCE OF THE NECESSARY PLANS AND PREPARATIONS FOR
A MAJOR CIVIL DEFENSE MOBILIZATION INVOLVING NEARLY
THE ENTIRE U. S. POPULATION, IT IS FOUND THAT THE
MATERIAL AND LABOR RESOURCES OF THE U. S. SHOULD
PERMIT AN AUSTERE SHELTER SYSTEM TO BE CONSTRUCTED
WITHIN A FEW (I.E., 2-4) WEEKS. AUSTERITY IN
THE ABOVE SENSE WOULD MEAN: (A) CROWDED
SHELTERS (2-3 PEOPLE OCCUPYING A SPACE NORMALLY
ALLOTTED FOR ONE); AND (B) DEFERRING TO A LATER
TIME THE INSTALLATION OF ENTRANCES, VENTILATION, AND
OTHER HABITABILITY ITEMS. THE TIME ESTIMATES ARE
MADE ON TECHNICAL CONSIDERATIONS ALONE. IT IS
ASSUMED THAT THE IMPORTANT PROBLEMS OF PLANNING,
ORGANIZING, ADMINISTERING, AND DECISION-MAKING WOULD
NOT SIGNIFICANTLY DELAY THE PROGRAM. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-655 538 13/13
AMMANN AND WHITNEY NEW YORK
TEST AND EVALUATION OF COMPUTER ANALYSIS PROGRAMS FOR
SHELTERS IN BUILDINGS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
MAY 67 100P WEISSMAN, SAMUEL I
DINAPOLI, PAT I COHEN, EDWARD I
CONTRACT: OCD-PS-65-72

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *BUILDINGS),
(*COMPUTER PROGRAMS, *CIVIL DEFENSE SYSTEMS),
NUCLEAR WEAPONS, FACTOR ANALYSIS, BLAST, GAMMA
RAYS, SHIELDING, CONSTRUCTION MATERIALS, COSTS,
NUCLEAR EXPLOSION DAMAGE, FIRES (U)

THE REPORT PRESENTS THE RESULTS OF A PROJECT TO
TEST AND EVALUATE FOUR COMPUTER PROGRAMS DEVELOPED BY
THE OFFICE OF CIVIL DEFENSE, IN ORDER TO
DETERMINE THEIR USEFULNESS IN ENGINEERING ANALYSIS OR
REVIEW OF PROTECTIVE STRUCTURES FOR CIVIL-DEFENSE
PURPOSES. THE PROGRAMS ARE (1) DYNAMIC
RESPONSE OF HIGH-RISE BUILDINGS TO NUCLEAR
BLAST LOADING-LINEAR DYNAMIC ANALYSIS,
(2) DYNAMIC RESPONSE OF HIGH-RISE
BUILDINGS TO NUCLEAR BLAST LOADINGS-
NONLINEAR DYNAMIC ANALYSIS, (3) ANALYSIS
OF STRUCTURES FOR FALLOUT GAMMA RADIATION
SHIELDING, AND (4) REUSABILITY OF BUILDINGS
AFTER A WARFIRE. TWO ACTUAL HIGH-RISE BUILDING
DESIGNS, A REINFORCED-CONCRETE FRAME STRUCTURE AND A
STRUCTURAL-STEEL FRAME STRUCTURE, WERE USED AS
PROTOTYPES FOR THE EVALUATION. THE PROGRAMS WERE
USED TO PERFORM ANALYSES TO DETERMINE NECESSARY
STRUCTURAL MODIFICATIONS TO INCORPORATE BLAST AND
FALLOUT PROTECTIVE DESIGN FEATURES IN THE ORIGINAL
DESIGN OF EACH BUILDING FOR THE 2.5 AND 10 PSI
OVERPRESSURE RANGES FOR A 10-MT NUCLEAR WEAPON.
THE FIRE PROTECTIVE CAPABILITY OF THE BUILDINGS FOR
EACH PROTECTIVE DESIGN WAS ALSO EVALUATED.
STRUCTURAL MODIFICATIONS AND INCREMENTAL COST ARE
PRESENTED IN THE FORM OF ENGINEERING CASE STUDIES.
A COMPARISON OF COMPUTATIONAL COSTS FOR THE TEST
BUILDINGS BY THE COMPUTER METHOD USED, WITH COSTS
ESTIMATED ASSUMING THE ANALYSES WERE PERFORMED BY
MANUAL METHODS IS PRESENTED. OTHER EVALUATIONS
WERE MADE PERTAINING TO (1) INPUT FORMS AND
COMPUTER OPERATION, (2) ECONOMIES OF DESIGN,
(3) COMPLETENESS OF PROGRAMS, (4) FLEXIBILITY
OF PROGRAMS, (5) USE OF THE PROGRAMS SEPARATELY. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-655 904 13/1 13/13
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
SHELTER LIGHTING KIT. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JAN 67 95P NEVERIL, R. B. :BEHLS, H.
F. 1
REPT. NO. GARD-1400

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *LIGHTING
EQUIPMENT), (*CIVIL DEFENSE SYSTEMS, *POWER
SUPPLIES), PERFORMANCE(ENGINEERING), COSTS,
LIGHT TRANSMISSION, FLUORESCENCE, LUMINESCENCE,
VOLTAGE (U)

THE SHELTER LIGHTING KIT INCLUDES A MANUALLY-
DRIVEN POWER UNIT AND A FLUORESCENT LIGHTING SYSTEM.
TWO POWER UNIT DESIGNS ARE PRESENTED FOR
PREPRODUCTION FABRICATION AND EVALUATION. ONE
POWER UNIT HAS A GENERATOR MOUNTED ON A BICYCLE-TYPE
FRAME AND DRIVEN BY A CHAIN AND SPROCKET
TRANSMISSION; WHILE THE OTHER UNIT HAS A GENERATOR
WITH AN INTEGRAL GEARED TRANSMISSION MOUNTED ON A
FOLDING TRIPOD FRAME. BOTH POWER UNITS ARE
DESIGNED FOR ONE-MAN OPERATION WITH A POWER INPUT OF
U.1 HORSEPOWER AT A NOMINAL PEDAL SPEED OF 55 RPM AND
A NOMINAL GENERATOR OUTPUT OF 50 WATTS AT 120 VOLTS
AC. THE SELECTION OF EITHER DESIGN FOR THE
PRODUCTION MODEL WILL DEPEND ON THEIR PERFORMANCE AND
A COST ANALYSIS. THE FLUORESCENT LIGHTING SYSTEM
CONSISTS OF TWO ADJUSTABLE LAMP FIXTURES AND TWO 20-
WATT OR 25-WATT PREHEAT FLUORESCENT LAMPS OPERATED IN
SERIES (SELECTED LAMP WATTAGE WILL DEPEND ON THE
OVERALL SYSTEM EFFICIENCY). THE ESTIMATED
PRODUCTION COST OF THE LIGHTING KIT IS \$90. AN
INCANDESCENT LIGHTING SYSTEM IS PROPOSED AS AN
OPTIONAL ACCESSORY FOR NIGHT LIGHTING OR BACKGROUND
ILLUMINATION IN MULTI-ROOM SHELTERS. THIS LIGHTING
SYSTEM CONSISTS OF FIVE 10-WATT INCANDESCENT LAMPS
WITH ADAPTER SOCKETS AND FIVE 50-FOOT EXTENSION
CORDS. THE ESTIMATED COST OF THIS ACCESSORY IS
\$7.30. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-656 595 13/13
PENNSYLVANIA STATE UNIV UNIVERSITY PARK SHELTER RESEARCH
AND STUDY PROGRAM
DESIGNING SHELTER IN NEW BUILDINGS, (U)
MAR 67 87P KNOTT, ALBERT I
MONITOR: OCD TR-43

UNCLASSIFIED REPORT

DESCRIPTORS: (•FALLOUT SHELTERS, DESIGN),
BUILDINGS, SHIELDING, GAMMA RAYS, CONSTRUCTION
MATERIALS, INSTRUCTION MANUALS, CIVIL DEFENSE
SYSTEMS (U)

THE MANUAL DISCUSSES RADIATION SHIELDING AS IT
APPLIES TO THE PRELIMINARY DESIGNING OF PROTECTION
AGAINST FALLOUT GAMMA RADIATION IN NEW CONSTRUCTION.
THE ARCHITECTURAL PRINCIPLES OF SHIELDING ARE
DISCUSSED AT LENGTH AND DESIGNING EXAMPLES ARE GIVEN.
PLANNING CHARTS ARE PRESENTED WHEREBY MATERIAL
WEIGHTS CAN BE SELECTED ON A PRELIMINARY BASIS TO
PROVIDE SHIELDING WHICH WILL SATISFY THE OFFICE OF
CIVIL DEFENSE REQUIREMENTS FOR COMMUNITY
SHELTERS. ENVIRONMENTAL CONTROL, SHELTER SUPPLY,
AND MANAGEMENT FACTORS ARE NOT DISCUSSED AS THEY ARE
AUXILIARY TO THE PROBLEM OF THE PROVISION OF
RADIATION PROTECTION. IT IS ANTICIPATED THAT THE
PRELIMINARY ARCHITECTURAL SCHEMES DEVELOPED THROUGH
THE USE OF THIS MANUAL WILL BE VERIFIED BY SKILLED
ANALYSTS BEFORE FINAL DESIGNS ARE COMPLETED.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-656 625 13/13
BECHTEL CORP GAITHERSBURG MD
PROTECTIVE BLAST SHELTER SYSTEM ANALYSIS. (U)
DESCRIPTIVE NOTE: FINAL REPT.
APR 67 244P
CONTRACT: OCD-PS-66-10

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, SYSTEMS ENGINEERING),
(*URBAN AREAS, SHELTERS), RHODE ISLAND,
POPULATION, DISTRIBUTION, SITE SELECTION,
HAZARDS, COSTS, CONSTRUCTION, ROADS,
UNDERGROUND STRUCTURES, CIVIL DEFENSE SYSTEMS (U)

FEASIBILITY OF 25 PSI BLAST SHELTER SYSTEM FOR
ENTIRE POPULATION OF PROVIDENCE, R. I. IS
INVESTIGATED. FACTORS ANALYZED INCLUDE: PEAK
POPULATION DISTRIBUTION; SITE AVAILABILITY AND
OWNERSHIP; ACCESSIBILITY AND TRAVEL TIME;
CHARACTERISTICS OF SITE AND SURROUNDING TERRAIN;
POTENTIAL FLOODING, FIRE, AND DEBRIS HAZARD; AND
POTENTIAL DUAL PURPOSE SHELTER APPLICATIONS. LEGAL
FINANCIAL AND CONSTRUCTION PROBLEMS ARE DISCUSSED.
MAPS AND TABLES DEFINE A NETWORK OF 46 SHELTERS
CAPABLE OF LOADING TO CAPACITY WITHIN 30 MINUTES
AFTER ALERT. COMPLETE COVERAGE OF POPULATED AREAS
OF THE CITY IS AFFORDED BY A MAXIMUM 3/4 MILE WALKING
RADIUS OF SHELTER. SINGLE PURPOSE SHELTERS COST AN
ESTIMATED \$204. PER PERSON. DUAL PURPOSE
SHELTERS SUCH AS GARAGES, SCHOOLS AND OFFICES COULD
REDUCE FEDERAL OUTLAY TO \$147. PER PERSON. COST
VARIATION OF SHELTER STRUCTURE AND SITE SENSITIVE
FACTORS WITH CAPACITY ARE GRAPHICALLY PRESENTED.
ADDITIONAL COST STUDIES COVER AUSTERE SHELTER WITH
PACKAGED VENTILATION KITS, COST OF UPGRADING EXISTING
BELOW GROUND STRUCTURES, AND LIFE SUPPORT SYSTEMS.
AN ADDENDUM DISCUSSES PROBLEMS OF CONSTRUCTING
SHELTERS UNDER STREETS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD#656 940 5/1 15/3 13/13
RESEARCH TRIANGLE INST DURHAM N C OPERATIONS RESEARCH AND
ECONOMICS DIV
BUDGE ALLOCATION FOR SHELTER SYSTEMS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JUN 67 107P MCHULLAN, PHILIP S. I
WRIGHT, JAMES C. I ANDERSON, HELEN S. I
TRUSTMAN, STANLEY I
REPT. NO. RTI-OU-230-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *BUDGETS),
(*CIVIL DEFENSE SYSTEMS, BUDGETS),
OPTIMIZATION, PROBABILITY, COST EFFECTIVENESS,
MANAGEMENT PLANNING (U)

A COMPUTER MODEL WHICH PREPARES OPTIMUM CIVIL
DEFENSE SHELTER POSTURES BUILT UPON THE BASE OF THE
CURRENT NATIONAL FALLOUT SHELTER SURVEY IS
DEVELOPED, PROGRAMMED, AND DEMONSTRATED. *OPTIMUM*
CAN BE BASED ON THE USER-SPECIFIED OBJECTIVE OF
EITHER MINIMUM FATALITIES OR MINIMUM CASUALTIES.
THE USER DETERMINES THE LEVEL OF RISK BY SUPPLYING
AN ATTACK ENVIRONMENT (BOTH BLAST AND FALLOUT)
WHICH IS USED TO CALCULATE THE PROBABILITY OF
FATALITY (OR CASUALTY) FOR A PERSON IN EACH
EXISTING SHELTER AND IN EACH PROPOSED SHELTER OPTION
IN EACH STANDARD LOCATION. POPULATION IS THEN
ASSIGNED TO EXISTING AND PROPOSED SHELTER IN AN
OPTIMUM MANNER, SUBJECT TO THE SPECIFIED BUDGET.
THE MATHEMATICAL FORMULATION IS EQUIVALENT TO A
LINEAR PROGRAM. THE MODEL ALSO PERMITS AN
EVALUATION OF SHELTER IMPROVEMENT PROGRAMS AGAINST
ANY USER SUPPLIED ATTACK ENVIRONMENT. AT THE
OPTION OF THE USER, THE FOLLOWING INPUTS MAY BE
VARIED: (A) BUDGET LEVEL, (B) DEGREE OF
RISK OR HAZARD, (C) DEFINITION OF SHELTER FALLOUT
OR BLAST VULNERABILITY, AND (D) COST PER SPACE OF
SHELTER. THE MODEL WAS DEMONSTRATED USING THE
STATE OF RHODE ISLAND. THE MODEL CAN BE USED
PRIMARILY IN SYNTHESIS AND ANALYSIS OF ANEAR FUTURE
SHELTER SYSTEMS AND CAN BE MODIFIED FOR USE IN MORE
COMPREHENSIVE SYSTEM STUDIES (E.G., COMBINED
WARNING, MOVEMENT, AND SHELTER SYSTEM STUDIES) AND
COST-EFFECTIVENESS EVALUATIONS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-658 898 15/3 5/1 5/9
OFFICE OF CIVIL DEFENSE WASHINGTON D C
SHELTER MANAGEMENT TEXTBOOK.
JUL 67 121P
REPT. NO. SM-141

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (•FALLOUT SHELTERS, •MANAGEMENT
ENGINEERING), (•CIVIL DEFENSE SYSTEMS,
TRAINING), TEXTBOOKS, RADIOBIOLOGY, WEAPONS,
SOCIOLOGY, POPULATION, ATMOSPHERE, TEMPERATURE
CONTROL, WATER, SAFETY, FOOD, SLEEP,
SANITARY ENGINEERING, MEDICINE, ILLUMINATION,
POWER, COMMUNICATION SYSTEMS, TRAINING,
PSYCHOLOGY, RELIGION, RECREATION

(U)

CONTENTS: OVERVIEW OF SHELTER MANAGEMENT;
RADIOLOGICAL PROTECTION; OTHER WEAPON EFFECTS;
PRE-OCCUPANCY MANAGEMENT RESPONSIBILITIES;
ORGANIZING THE SHELTER POPULATION; ORGANIZING
SHELTER RESOURCES; ORGANIZING ACTIVITIES AND
PATTERNS OF LIVING; ATMOSPHERE AND TEMPERATURE
CONTROL; WATER; SAFETY; FOOD; SLEEP;
SANITATION; MEDICAL CARE; ILLUMINATION AND
POWER; COMMUNICATION; TRAINING; PSYCHOLOGICAL
SUPPORT; RELIGIOUS, RECREATIONAL, AND SERVICE
ACTIVITIES; POST-OCCUPANCY MANAGEMENT
RESPONSIBILITIES.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD#659 377 15/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND
POLITICAL STUDIES DIV
AN OPTIMIZATION STUDY OF BLAST SHELTER DEPLOYMENT.
VOLUME 1. SUMMARY, (U)
SEP 66 102P MITCHELL, DAVID L. :

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH LAMDA
CORP., ARLINGTON, VA. SEE ALSO VOLUME 2: AD-659
378.

DESCRIPTORS: (*FALLOUT SHELTERS, DEPLOYMENT),
(*CIVIL DEFENSE SYSTEMS, OPTIMIZATION),
NUCLEAR WARFARE, EFFECTIVENESS, VULNERABILITY,
POPULATION, BUDGETS, NUCLEAR WARFARE CASUALTIES,
DAMAGE, EXPLOSION EFFECTS, INDUSTRIES (U)

THE STUDY EXAMINES METHODS OF DETERMINING BLAST
SHELTER DEPLOYMENTS AND OF ASSESSING THEIR
PERFORMANCE FOR A VARIETY OF NUCLEAR ATTACKS. THE
GOAL IS NOT TO SEEK A SINGLE OPTIMAL DEPLOYMENT,
WHICH GENERALLY REQUIRES MAKING ARBITRARY ASSUMPTIONS
ON THE NATURE AND SIZE OF THE ATTACK, THUS
OVERLOOKING THE ATTACKER'S FREEDOM OF CHOICE AFTER A
BLAST SHELTER PROGRAM HAS BEEN DEPLOYED. RATHER,
THE STUDY SEEKS 'STABILIZED' DEPLOYMENTS WHICH
PROTECT POPULATION ALMOST AS WELL AS AN OPTIMAL
DEPLOYMENT, EVEN THOUGH IT IS NOT TRULY OPTIMAL FOR
ANY SPECIFIED ATTACK. THE STUDY EXAMINES THE
ATTACKER'S FREEDOM TO VARY FORCE LEVEL, TIME OF
ATTACK, ATTACK OBJECTIVE, HEIGHT OF BURST, AND
TARGETING. A QUITE GENERAL AND FLEXIBLE COMPUTER
MODEL BLAST, BASED ON GENERALIZED LAGRANGE
MULTIPLIERS, GENERATES SHELTER DEPLOYMENTS FOR THE
U. S. AND COMPUTES THEIR EFFECTIVENESS AGAINST
ATTACKS IN WHICH THESE FACTORS ARE VARIED. IN
BLAST THE NATION IS CONSIDERED AS A COLLECTION OF
CELLS TWO NAUTICAL MILES SQUARE, PROVIDING A DETAILED
ANALYSIS OF THE OFFENSE/DEFENSE INTERACTION.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-659 378 15/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND
POLITICAL STUDIES DIV
AN OPTIMIZATION STUDY OF BLAST SHELTER DEPLOYMENT.
VOLUME II. APPENDICES A-G. (U)
SEP 66 102P MITCHELL, DAVID L. ;
BENSON, LOREN A. ; GALIANO, ROBERT J. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH LAMBDA
CORP., ARLINGTON, VA. SEE ALSO VOLUME I, AD-659
377 AND VOLUME 3, AD-659 379.

DESCRIPTORS: (•FALLOUT SHELTERS, DEPLOYMENT),
(•CIVIL DEFENSE SYSTEMS, OPTIMIZATION),
NUCLEAR WARFARE, EFFECTIVENESS, VULNERABILITY,
POPULATION, BUDGETS, NUCLEAR WARFARE CASUALTIES,
DAMAGE, EXPLOSION EFFECTS, INDUSTRIES,
MATHEMATICAL MODELS (U)

CONTENTS: ADDITIONAL LAGRANGE MULTIPLIER
THEORY; A CITY TARGETING MODEL UTILIZING
SIMULTANEOUS WEAPON LAYDOWNS; AN ANALYTICAL MODEL
FOR BLAST SHELTER DEPLOYMENT; POPULATION AND
INDUSTRY DISTRIBUTION; SUGGESTED ADDITIONAL STUDY;
PARAMETERS FOR CURVES; HOUSTON AND APRIL
SHELTER DATA. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-659 379 15/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND
POLITICAL STUDIES DIV
AN OPTIMIZATION STUDY OF BLAST SHELTER DEPLOYMENT.
VOLUME III. APPENDIX M- BLAST - THE COMPUTER
PROGRAM. (U)
SEP 66 144P MITCHELL, DAVID L. 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH LAMBDA
CORP., ARLINGTON, VA. SEE ALSO VOLUME 2, AD-660
378.

DESCRIPTORS: (*FALLOUT SHELTERS, DEPLOYMENT);
(*CIVIL DEFENSE SYSTEMS, OPTIMIZATION);
NUCLEAR WARFARE, EFFECTIVENESS, VULNERABILITY,
POPULATION, BUDGETS, NUCLEAR WARFARE CASUALTIES,
DAMAGE, EXPLOSION EFFECTS, INDUSTRIES,
COMPUTER PROGRAMS (U)

THE FIRST FUNCTION OF THE PROGRAM IS TO GENERATE A
BLAST SHELTER DEFENSE POSTURE OF A SPECIFIED COST
LEVEL FOR WHATEVER POPULATION DATA IS SUPPLIED, AND
THEN TO CALCULATE THE FATALITIES WHICH THAT POSTURE
PERMITS FOR A RANGE OF ATTACK LEVELS. THE SECOND
FUNCTION OF THE PROGRAM IS TO COMPUTE, FOR ANY COST
LEVEL SPECIFIED, UPPER AND LOWER BOUNDS FOR THE
OPTIMUM DEFENSE PERFORMANCE AT EACH ATTACK LEVEL -
THE BOUNDING PROCEDURE. THE THIRD FUNCTION IS TO
EVALUATE INDEPENDENTLY THE CELL MODEL BY COMPARING
RESULTS USING THE CELL MODEL WITH RESULTS USING A
SEPARATE LAYDOWN METHOD - THE TARGETING MODEL.
SINCE THE TARGETING MODEL IS USED QUITE SEPARATELY
FROM THE REST OF THE PROGRAM, THAT PORTION OF THE
PROGRAM IS DISCUSSED IN APPENDIX B. THE
PROGRAM ITSELF HAS THE SAME THREE DIVISIONS WITH A
DRIVER PROGRAM WHICH CONTROLS THE SELECTION OF THE
PROGRAM TO BE RUN. IF THE DRIVER DATA IS READ IN,
PARAMETERS ARE SET, AND THEN THE PORTION OF THE
PROGRAM CONTAINING THE DESIRED PROGRAM (CALLED AN
OVERLAY, IS READ IN. THE DESIRED PROGRAM IS
EXECUTED USING SUBROUTINES IN THE MAIN PORTION OF THE
PROGRAM PLUS THE PROPER OVERLAY. THE NEXT THREE
SECTIONS DESCRIBE HOW TO USE THE PROGRAM IN DETAIL.
THE FIRST DESCRIBES THE OPTIONS AND PARAMETERS TO
BE SET, THE SECOND GIVES SAMPLE DATA DECKS FOR THE
DIFFERENT RUNS AND THE DATA SEQUENCES FOR ALL
POSSIBLE TYPES OF RUNS, AND THE THIRD DESCRIBES THE
OPERATIONS OF THE SUBROUTINES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-659 800 13/2 13/13 14/1
STANFORD RESEARCH INST MENLO PARK CALIF
SHELTER WATER SUPPLY STUDY; COST IMPLICATIONS OF
EMERGENCY SOURCES. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
AUG 67 186P JENSEN, GORDON F. ;
CONTRACT: DAHC20-67-C-0136
PROJ: SRI-MU-6300-170

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *CIVIL DEFENSE
SYSTEMS), (*WATER SUPPLIES, SOURCES), COSTS,
WATER TANKS, WATER WELLS, TANKS(CONTAINERS),
COST EFFECTIVENESS, RADIOACTIVE FALLOUT,
SURVIVAL (U)

THE STUDY COMPARES SELECTED ALTERNATIVE METHODS OF
SUPPLYING EMERGENCY DRINKING WATER TO INHABITANTS OF
FALLOUT SHELTERS. THE RESPECTIVE COSTS AND SOME OF
THE QUALITATIVE CONSIDERATIONS OF EACH SYSTEM WERE
INVESTIGATED, WITH PARTICULAR EMPHASIS ON COMPARISONS
OF MUNICIPAL SYSTEMS, TRAPPED WATER, WATER
CONTAINERS, TANKS, AND WELLS. THIS STUDY REPORTS
ON THE TRADEOFFS BETWEEN COST, SHELTER SIZE, AND WELL
DEPTH OF EMERGENCY WATER SOURCES. THE TRADEOFFS
ARE INVESTIGATED BY A SERIES OF COST-SENSITIVITY
CURVES. THE CAPABILITIES AND DETAILS OF THE
MUNICIPAL WATER SOURCES FOR TWO SAMPLE CITIES ARE
ALSO REPORTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-661 063 15/3 5/11
PITTSBURGH UNIV PA DEPT OF SOCIOLOGY
HOME SHELTER SURVEYS: PATTERNS OF ACCEPTANCE, (U)
AUG 67 98P NEMNEVAJSA, JIRI I
CONTRACT: DAHC20-67-C-0122, NSF-G11300

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, PUBLIC
OPINION), CIVIL DEFENSE SYSTEMS, POPULATION,
QUESTIONNAIRES, ACCEPTABILITY, ATTITUDES,
STATISTICAL ANALYSIS (U)

THE REPORT ELABORATES RESPONSES OF 1471 NATIONALLY
SAMPLED AMERICANS TO AN ITEM PROBING THE
DESIRABILITY OF HOME SHELTER SURVEYS BY DEMOGRAPHIC,
SOCIO-CULTURAL AND SELECTED ATTITUDINAL
CHARACTERISTICS. THE DATA ARE DRAWN FROM THE 1966
FIELD STUDY. IN THIS MANNER, THE PERSPECTIVES
REGARDING HOME SHELTER SURVEYS ARE EVALUATED BY 135
DEMOGRAPHIC AND 110 ATTITUDINAL SUBGROUPS OF OUR
POPULATION. THE FINDINGS INDICATE THAT THE HOME
SHELTER SURVEY CONCEPT IS QUITE ACCEPTABLE TO THE
NATION. UNFAVORABLE EXPRESSIONS OCCUR IN LOW
FREQUENCIES AND ONLY SIX OF ALL THE SUBGROUPS
CONSIDERED ACTUALLY YIELD A NEGATIVE DESIRABILITY
AVERAGE IN RELATION TO THE QUESTION. OF THESE
SUBGROUPS, IN FACT, THREE REPRESENT AMERICANS WHO
ARE IN VARYING DEGREES OPPOSED TO CIVIL DEFENSE AS A
WHOLE. BY AND LARGE, AND WITHIN THE OVERALL
PATTERN OF FAVORABLENESS, THE ATTITUDINAL VARIABLES
DIFFERENTIATE AMONG THE RESPONDENT SUBGROUPS MORE
THAN DO DEMOGRAPHIC CHARACTERISTICS. IN VIEW OF
THE FACT THAT POSITIVE ASSESSMENTS ACTUALLY EXCEED
TWO-THIRDS OF THE RESPONDENTS AND THE CONCEPT IS NOT
TYPICAL OF SPECIFIC SEGMENTS OF OUR POPULATION, WE
CONCLUDE THAT SOMETHING OF A NATIONAL CONSENSUS
PREVALES WITH REGARD TO THE DESIRABILITY OF HOME
SHELTER SURVEYS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-661 314 5/1 5/9 15/3
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA SOCIAL
SYSTEMS PROGRAM
THE SHELTER MANAGEMENT CONTINGENCY GAME: I.
DEVELOPMENT AND INITIAL EVALUATION OF A TRAINING
VERSION. (U)
DESCRIPTIVE NOTE: FINAL REPT. MAY 66-APR 67.
APR 67 399P HALE, JOHN F. ; BEND, EMIL ;
JEFFREYS, FRANK B. ;
REPT. NO. AIR-F-13-4/67-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *MANAGEMENT
ENGINEERING), (*TRAINING DEVICES, GAME
THEORY), FEASIBILITY STUDIES, INSTRUCTORS,
CIVIL DEFENSE PERSONNEL, SOCIAL PSYCHOLOGY,
CONFINED ENVIRONMENTS, VENTILATION (U)

THE PURPOSE OF THE WORK WAS THE FURTHER DEVELOPMENT
OF A SHELTER MANAGEMENT CONTINGENCY GAME.
THE GOAL WAS TO DEMONSTRATE THE FEASIBILITY OF THE
GAME AS A TRAINING DEVICE, AND SO THE MAIN EMPHASIS
IN THE WORK CONSISTED OF THE PRODUCTION AND TESTING
OF A VERSION OF THE GAME WHICH COULD BE USED IN
SHELTER MANAGEMENT TRAINING COURSES. THE GAME, AS
DEVELOPED, CAN BE PLAYED BY THE INDIVIDUAL STUDENT
WITHOUT THE NECESSITY OF SUPERVISION BY THE
INSTRUCTOR. RECORD-KEEPING PROCEDURES WERE
ESTABLISHED SO THAT THE STUDENT'S PLAY CAN BE
REVIEWED AND CRITIQUED BY THE INSTRUCTOR UPON
CONCLUSION OF THE GAME. THE GAME WAS TESTED BY
MEMBERS OF THE AMERICAN INSTITUTES FOR RESEARCH
(AIR) RESEARCH STAFF, AND THE RESULTS OF THESE TEST
PLAYS ARE REPORTED. IN ADDITION, COPIES OF THE
GAME WERE SENT TO OFFICE OF CIVIL DEFENSE FIELD
TRAINING PERSONNEL FOR REVIEW AND COMMENT. IN
GENERAL, THE GAME APPEARS TO HOLD PROMISE AS A USEFUL
TRAINING DEVICE. DIRECTIONS FOR FURTHER
DEVELOPMENT OF THE GAME, PARTICULARLY AS A RESEARCH
TOOL, WERE DISCUSSED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-662 616 15/3 13/13
PITTSBURGH UNIV PA DEPT OF SOCIOLOGY
ORIENTATIONS TOWARD COMMUNITY AND PRIVATE SHELTER
SYSTEMS, (U)
AUG 67 62P HAST, ROBERT H. I
CONTRACT: DAHC20-67-C-0122

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJ. VIEWS ABOUT CIVIL
DEFENSE ISSUES.

DESCRIPTORS: (*FALLOUT SHELTERS, PUBLIC
OPINION); (*RADIOACTIVE FALLOUT, *SHELTERS),
CIVIL DEFENSE SYSTEMS, PROTECTION, SOCIOLOGY,
ENVIRONMENT, PROFESSIONAL PERSONNEL, ATTITUDES,
ACCEPTABILITY, DECISION MAKING (U)

THE PAPER INVESTIGATES THE AMERICAN PUBLIC'S
PATTERNS OF FAVORABILITY TOWARD COMMUNITY FALLOUT
SHELTERS AND THE PATTERNS OF PREFERENCE FOR COMMUNITY
OR PRIVATE SHELTERS. NATIONAL OPINION STUDIES
BETWEEN 1960 AND 1966 REVEALED OVERWHELMING SUPPORT
FOR THE IDEA OF COMMUNITY SHELTERS. NATIONAL
STUDIES BETWEEN 1961 AND 1963 SHOWED ABOUT HALF OF
THE PUBLIC PREFERRING COMMUNITY SHELTERS WHILE 30 TO
40 PER CENT PREFERRED PRIVATE SHELTERS. IN
GENERAL, THOSE OPPOSED TO CIVIL DEFENSE ARE OPPOSED
TO ITS SPECIFIC PROGRAMS. THOSE GROUPS FAVORING
THE IDEA OF COMMUNITY SHELTERS WHILE PREFERRING
PRIVATE WERE MORE LIKELY TO BE STRONGLY ORIENTED TO
THE FAMILY GROUP. THOSE OPPOSING THE IDEA OF
COMMUNITY SHELTERS BUT PREFERRING THEM OVER PRIVATE
SHELTERS FOR PROTECTION WERE MORE LIKELY TO BE THE
SOCIALLY UNATTACHED AND THE UNPROTECTED. MEN, MORE
THAN WOMEN, TEND TO OPPOSE THE IDEA OF COMMUNITY
SHELTERS WHILE PREFERRING PRIVATE SHELTERS FOR
PROTECTION. WOMEN, MORE THAN MEN, TEND TO FAVOR
COMMUNITY SHELTERS AND ALSO PREFER THEM FOR
PROTECTION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-662 724 5/1 15/3 5/10
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR
PERFORMANCE TECHNOLOGY
TWO SIMULATION TECHNIQUES FOR FALLOUT SHELTER
RESEARCH: THEIR PROPERTIES AND AN APPLICATION TO
EVALUATING SHELTER MANAGEMENT GUIDANCE. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
SEP 67 133P HEAGLEY, DONALD E. ;
SMITH, ROBERT W. ; DUEKER, RICHARD L. ;
REPT. NO. AIR-093A-9/67-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, MANAGEMENT
ENGINEERING), (*FALLOUT SHELTERS, MANAGEMENT
ENGINEERING), LEADERSHIP, CONFINED ENVIRONMENTS,
BEHAVIOR, MOTIVATION, SURVIVAL, INSTRUCTION
MANUALS, STRESS (PSYCHOLOGY) (U)

TWO METHODS FOR SIMULATING IN SUBJECTS THE
SURVIVAL SET TO BE EXPECTED IN SHELTERS WERE
DEVELOPED, AND THEIR EFFECTIVENESS WAS TESTED.
SECOND, THE EFFECTIVENESS OF TWO TYPES OF SHELTER
MANAGEMENT GUIDANCE IN SMALL SHELTERS WITH EMERGENT
MANAGEMENT WERE EVALUATED. THE TWO *SURVIVAL SET*
SIMULATION TECHNIQUES DEVELOPED WERE ENVIRONMENTAL
THREAT AND INTERNAL STRESS. UNDER ENVIRONMENTAL
THREAT, SUBJECTS WERE CONFINED IN AN AIR-FILLED TANK,
SUBMERGED 20 FEET IN WATER. HERE THE THREAT OF THE
SURROUNDING WATER SUBSTITUTED FOR THE THREAT OF
RADIATION. INTERNAL STRESS WAS CONDUCTED IN NORMAL
ROOM CONFIGURATION. HERE, THREAT OF PAY REDUCTION
FOR INADEQUATE PERFORMANCE OF SHELTER FUNCTIONS
SERVED AS A SUBSTITUTE MOTIVATION FOR THREAT OF DEATH
OR INJURY. THE TWO TECHNIQUES PRODUCED DIFFERING
KINDS OF REALISM. WHILE INTERNAL STRESS SUBJECTS
DEMONSTRATED GREAT VIGOR AND INITIATIVE IN PERFORMING
SURVIVAL FUNCTIONS, ENVIRONMENTAL THREAT SUBJECTS
EXHIBITED COMPARATIVELY HIGH TENSION LEVELS AND
ATTENTIVENESS TO GUIDANCE. THE ADVANTAGES OF EACH
TECHNIQUE ARE DISCUSSED, AND SUGGESTIONS FOR OTHER
APPLICATIONS ARE MADE. THE TWO TYPES OF GUIDANCE
COMPARED WERE AN EXTENSIVE, 200-PAGE HANDBOOK (FULL
GUIDANCE) AND A LARGE, FOLDED SINGLE SHEET WHICH
TERSELY OUTLINED ESSENTIAL MANAGEMENT PROCEDURES
(ABBREVIATED GUIDANCE). THE LATTER WAS BASED
ON THE LARGER DOCUMENT. THERE WAS A GENERALLY
UNANIMOUS TENDENCY TO SHOW THAT THE ABBREVIATED
GUIDANCE WAS SUPERIOR ACROSS ALL VARIABLES. IT WAS
POINTED OUT THAT THESE RESULTS APPLY ONLY TO SMALL
SHELTERS UNDER EMERGENT MANAGEMENT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-663 483 15/3

DEPARTMENT OF THE ARMY WASHINGTON D C

CIVIL DEFENSE: A BIBLIOGRAPHY SURVEY 1960-67. (U)

DEC 67 123P

REPT. NO. DA-PAM-500-3

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, BIBLIOGRAPHIES), NUCLEAR WARFARE, NATIONAL DEFENSE, DEFENSE SYSTEMS, ARMS CONTROL, DISARMAMENT, ATTITUDES, SYMPOSIA, UNITED STATES GOVERNMENT, URBAN AREAS, MANPOWER, MANAGEMENT PLANNING, DISASTERS, CIVIL DEFENSE PERSONNEL, PUBLIC OPINION, FALLOUT SHELTERS, SURVIVAL (U)

A BIBLIOGRAPHIC SURVEY IS PRESENTED OF THE FOLLOWING CATEGORIES: (1) THE MENACE OF NUCLEAR WAR AND STRATEGIES FOR NATIONAL DEFENSE; (2) CIVIL DEFENSE AND THE AMERICAN PEOPLE; (3) CONGRESS AND CIVIL DEFENSE; (4) IMPLEMENTING AND ADMINISTERING CIVIL DEFENSE (CIVIL DEFENSE PLANS, PROGRAMS, AND OPERATIONS; FALLOUT AND THE PUBLIC--THE SHELTER PROGRAM; PREATTACK PLANNING FOR SURVIVAL AND POSTATTACK RECOVERY); (5) CIVIL DEFENSE IN FOREIGN COUNTRIES; (6) SOURCES FOR REFERENCE AND FURTHER STUDY. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-663 832 5/11 15/3 15/6
IOWA STATE UNIV AMES DEPT OF SOCIOLOGY AND
ANTHROPOLOGY
FACTORS RELATED TO ADOPTION PROGRESS. A 1966
NATIONAL STUDY OF PUBLIC FALLOUT SHELTER ADOPTION. (U)
DESCRIPTIVE NOTE: SUMMARY REPT.,
AUG 67 BOP KLONGLAN, GERALD E. ;
BEAL, GEORGE M. ; BOHLEN, JOE M. ; COWARD, E.
WALTER, JR;
REPT. NO. RURAL SOCIOLOGY-645
CONTRACT: DAMC20-67-C-0123

UNCLASSIFIED REPORT

DESCRIPTORS: (FALLOUT SHELTERS, PUBLIC
OPINION), QUESTIONNAIRES, NUCLEAR WARFARE,
SURVIVAL, ATTITUDES, CIVIL DEFENSE SYSTEMS,
COLD WAR, PERCEPTION (PSYCHOLOGY), SOCIAL
PSYCHOLOGY, ACCEPTABILITY, SOCIAL COMMUNICATION (U)

THE STUDY USES CONCEPTS RELATED TO ADOPTION AND
DIFFUSION PROCESSES TO ANALYZE THE PUBLIC'S PROGRESS
IN ADOPTING THE IDEA OF USING PUBLIC FALLOUT SHELTERS
IN THE EVENT OF A NUCLEAR ATTACK. THE ANALYSIS IS
BASED ON DATA COLLECTED IN THE 1966 OCD NATIONAL
SURVEY OF 1497 RESPONDENTS. RESPONDENTS ARE
ASSIGNED TO ONE OF FIVE ADOPTION STAGES: 21% OF THE
RESPONDENTS WERE UNAWARE OF THE EXISTENCE OF PUBLIC
FALLOUT SHELTERS (UNWARE STAGE); 20% WERE
AWARE OF PUBLIC FALLOUT SHELTERS BUT HAD NO
ADDITIONAL INFORMATION ABOUT THEM (AWARE STAGE);
24% WERE AWARE OF AND HAD ADDITIONAL INFORMATION
BUT HAD NOT THOUGHT ABOUT USING PUBLIC FALLOUT
SHELTERS (INFORMATION STAGE); 19% WERE AWARE
OF, HAD ADDITIONAL INFORMATION, HAD THOUGHT ABOUT,
BUT HAD NOT DECIDED TO GO OR NOT GO TO A PUBLIC
FALLOUT SHELTER (EVALUATION STAGE); AND 16%
WERE AWARE OF, HAD ADDITIONAL INFORMATION, HAD
THOUGHT ABOUT AND HAD DECIDED TO GO TO A PUBLIC
FALLOUT SHELTER IN THE EVENT OF A NUCLEAR ATTACK
(ADOPTION STAGE). THE STUDY ALSO ANALYZES THE
RELATIONSHIPS BETWEEN STAGE OF ADOPTION AND THE
FOLLOWING FACTORS: (1) PERSONAL ATTRIBUTES,
(2) PERCEPTIONS OF THREAT, (3) PERCEPTIONS OF
CIVIL DEFENSE, (4) PERCEPTIONS OF FALLOUT
SHELTERS AND (5) SOURCES OF INFORMATION.
NUMEROUS STATISTICALLY SIGNIFICANT RELATIONSHIPS
WERE FOUND BETWEEN THESE FACTORS AND STAGE OF
ADOPTION. FINDINGS ARE COMPARED WITH FINDINGS FROM
THE 1964 OCD NATIONAL SURVEY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-664 171 13/4 13/2 13/13
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
DUAL-PURPOSE WATER CONTAINER. (U)
DESCRIPTIVE NOTE: FINAL REPT. APR 66-JUN 67;
JUN 67 74P KAPIL, A. L. I
REPT. NO. GARD-1404-F
PROJ: 1433B

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY OFFICE
OF CIVIL DEFENSE, WASHINGTON, D. C. PREPARED IN
COOPERATION WITH STANFORD RESEARCH INST., MENLO
PARK, CALIF.

DESCRIPTORS: (*WATER TANKS; DESIGN), (*WATER
SUPPLIES, FALLOUT SHELTERS), (*TOILET
FACILITIES, CONTAINERS), STORAGE TANKS,
POLYETHYLENE PLASTICS, CIVIL DEFENSE SYSTEMS,
LIFE EXPECTANCY; MECHANICAL PROPERTIES,
WASTES(SANITARY ENGINEERING) (U)

A 14-GALLON, DUAL-PURPOSE POLYETHYLENE CONTAINER
WAS DEVELOPED FOR STORING WATER IN FALLOUT SHELTERS.
AFTER THE WATER IS CONSUMED, THE CONTAINER CAN BE
CONVERTED INTO A COMMODE. TESTS ON PROTOTYPE
CONTAINERS SHOW THE DESIGN TO BE SATISFACTORY.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-664 183 5/11 15/3
IOWA STATE UNIV AMES DEPT OF SOCIOLOGY AND
ANTHROPOLOGY
FACTORS RELATED TO ADOPTION PROGRESS. A 1966
NATIONAL STUDY OF PUBLIC FALLOUT SHELTER ADOPTION. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
AUG 67 420P KLONGLAN, GERALD E. ;
BEAL, GEORGE M. ; BOHLEN, JOE M. ; COWARD, E.
WALTER, JR.;
REPT. NO. RURAL SOCIOLOGY-64
CONTRACT: DAHC20-67-C-0123

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, PUBLIC
OPINION), ACCEPTABILITY, ATTITUDES,
QUESTIONNAIRES, SOCIOLOGY, CIVIL DEFENSE
SYSTEMS, STATISTICAL ANALYSIS,
PERCEPTION (PSYCHOLOGY), COLD WAR, FOREIGN
POLICY, LIMITED WAR, COMMUNISTS, SURVIVAL,
DISARMAMENT, NATIONAL DEFENSE, NUCLEAR WARFARE,
THREAT EVALUATION (U)

THE STUDY USES CONCEPTS RELATED TO ADOPTION AND
DIFFUSION PROCESSES TO ANALYZE THE PUBLIC'S PROGRESS
IN ADOPTING THE IDEA OF USING PUBLIC FALLOUT SHELTERS
IN THE EVENT OF A NUCLEAR ATTACK. THE ANALYSIS IS
BASED ON DATA COLLECTED IN THE 1966 OCD NATIONAL
SURVEY OF 1497 RESPONDENTS. RESPONDENTS ARE
ASSIGNED TO ONE OF FIVE ADOPTION STAGES: 218 OF THE
RESPONDENTS WERE UNAWARE OF THE EXISTENCE OF PUBLIC
FALLOUT SHELTERS (UNAWARE STAGE); 208 WERE
AWARE OF PUBLIC FALLOUT SHELTERS BUT HAD NO
ADDITIONAL INFORMATION ABOUT THEM (AWARE STAGE);
248 WERE AWARE OF AND HAD ADDITIONAL INFORMATION
BUT HAD NOT THOUGHT ABOUT USING PUBLIC FALLOUT
SHELTERS (INFORMATION STAGE); 198 WERE AWARE
OF, HAD ADDITIONAL INFORMATION, HAD THOUGHT ABOUT,
BUT HAD NOT DECIDED TO GO OR NOT GO TO A PUBLIC
FALLOUT SHELTER (EVALUATION STAGE); AND 168
WERE AWARE OF, HAD ADDITIONAL INFORMATION, HAD
THOUGHT ABOUT AND HAD DECIDED TO GO TO A PUBLIC
FALLOUT SHELTER IN THE EVENT OF A NUCLEAR ATTACK
(ADOPTION STAGE). THE STUDY ALSO ANALYZES THE
RELATIONSHIPS BETWEEN STAGE OF ADOPTION AND THE
FOLLOWING FACTORS: (1) PERSONAL ATTRIBUTES,
(2) PERCEPTIONS OF THREAT, (3) PERCEPTIONS OF
CIVIL DEFENSE, (4) PERCEPTIONS OF FALLOUT
SHELTERS AND (5) SOURCES OF INFORMATION.
NUMEROUS STATISTICALLY SIGNIFICANT RELATIONSHIPS
WERE FOUND BETWEEN THESE FACTORS AND STAGE.

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BM 27

AD-664 439 13/13 18/6 18/8

OFFICE OF CIVIL DEFENSE WASHINGTON D C

FALLOUT SHELTERS. (U)

DEC 67 8P

RERT. NO. OCD-TR-39

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, DESIGN),
NUCLEAR RADIATION, SHIELDING, RADIOACTIVE
FALLOUT, RADIATION EFFECTS, NUCLEAR EXPLOSION
DAMAGE, BLAST, CIVIL DEFENSE SYSTEMS, BUILDINGS,
SPECIFICATIONS, VENTILATION, CONSTRUCTION,
DOSAGE, AIRBURST, SURFACE BURST (U)

IDENTIFIERS: YIELD, FIREBALL (NUCLEAR
BURST) (U)

THE PURPOSE OF THE REPORT IS TO PROVIDE TECHNICAL
INFORMATION AND REFERENCES FOR THE CONVENIENCE OF
DESIGN PROFESSIONALS. THIS INFORMATION IS
SUPPLEMENTED BY PUBLICATIONS AND BY THE ARCHITECTURAL
AND ENGINEERING SERVICES WHICH ARE DESCRIBED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-664 477 13/13 15/3
OFFICE OF CIVIL DEFENSE WASHINGTON D C
MINIMUM TECHNICAL REQUIREMENTS FOR FAMILY
SHELTERS. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.

AUG 62 SP
REPT. NO. OCD-TM-61-1

UNCLASSIFIED REPORT

DESCRIPTORS: (•FALLOUT SHELTERS,
SPECIFICATIONS), CIVIL DEFENSE SYSTEMS, BLAST,
PROTECTION, VENTILATION, CONSTRUCTION, FIRE
SAFETY, FIRE RESISTANT MATERIALS, SHIELDING,
NUCLEAR RADIATION, GAMMA RAYS, RADIOACTIVE
FALLOUT, WATER SUPPLIES, SANITARY ENGINEERING,
DESIGN (U)

THE PURPOSE OF THESE MINIMUM TECHNICAL REQUIREMENTS
IS TO ESTABLISH OFFICIAL STANDARDS WHICH WILL PROVIDE
THE BASIS FOR EFFECTIVE FAMILY SHELTER DESIGNS.
MINOR MODIFICATIONS TO SUIT LOCAL BUILDING CODES
MAY BE NECESSARY. HOWEVER, CARE MUST BE TAKEN NOT
TO DIMINISH THE PROTECTIVE CHARACTERISTICS OF THE
SHELTER. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BHL27

AD-664 478 13/13 15/3
OFFICE OF CIVIL DEFENSE WASHINGTON D C
FALLOUT SHELTER SURVEYS; GUIDE FOR ARCHITECTS AND
ENGINEERS. (U)

DESCRIPTIVE NOTE: NATIONAL PLAN APPENDIX SERIES.

MAY 60 54P
REPT. NO. OCD-NP-10-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, STANDARDS),
BUILDINGS, RADIOACTIVE FALLOUT, GAMMA RAYS,
SHIELDING, ROOFS, VENTILATION, WATER SUPPLIES,
SANITARY ENGINEERING, SPECIFICATIONS, POWER
SUPPLIES, HAZARDS, SURVIVAL, URBAN AREAS,
CIVIL DEFENSE SYSTEMS, STRUCTURES, UNDERGROUND
STRUCTURES (U)

IDENTIFIERS: HABITABILITY (U)

THE PURPOSE OF THIS GUIDE IS TO PROVIDE ARCHITECTS
AND ENGINEERS WITH PROCEDURES AND STANDARDS FOR
(1) EVALUATING THE FALLOUT SHELTER POTENTIAL OF
EXISTING STRUCTURES, AND (2) MODIFYING STRUCTURES
FROM THE STANDPOINT OF RADIATION SHIELDING AND
HABITABILITY TO IMPROVE THEIR WORTH AS FALLOUT
SHELTERS. THESE SAME PROCEDURES AND STANDARDS MAY
BE USED FOR PRELIMINARY DESIGN TO INCORPORATE SHELTER
INTO NEW STRUCTURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-664 479 18/3 13/13
OFFICE OF CIVIL DEFENSE WASHINGTON D C
CIVIL ENGINEERING IN A NUCLEAR ENVIRONMENT. (U)
JUN 64 70P
REPT. NO. TR-26

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PRESENTATION AT
ENVIRONMENTAL ENGINEERING CONFERENCE, ATLANTA,
GA., 26 FEB 63.

DESCRIPTORS: (•NUCLEAR EXPLOSIONS, FALLOUT
SHELTERS), (•STRUCTURES, DESIGN), CIVIL
ENGINEERING, NUCLEAR WEAPONS, BLAST, THERMAL
RADIATION, CIVIL DEFENSE SYSTEMS, UNDERGROUND
STRUCTURES, NUCLEAR EXPLOSION DAMAGE,
FOUNDATIONS(STRUCTURES), SYMPOSIA,
BUILDINGS, VULNERABILITY, NUCLEAR WARFARE,
ENVIRONMENTAL TESTS, RADIOACTIVE FALLOUT, FIRE
RESISTANT MATERIALS (U)

CONTENTS: ENGINEERING IN A BLAST ENVIRONMENT -
DESIGN OF SIMPLE STRUCTURES FOR MODERATE LEVELS OF
BLAST RESISTANCE; ENGINEERING IN A THERMAL
ENVIRONMENT (WARFIRE RESISTANCE AND REUSABILITY OF
BUILDINGS, THERMAL RADIATION FROM NUCLEAR
EXPLOSIONS); ENGINEERING IN A FALLOUT ENVIRONMENT
(FUNDAMENTAL CONCEPTS IN FALLOUT SHELTER, FALLOUT
PROBLEMS IN CIVIL DEFENSE). (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-666 233 15/3 5/10
MRB-SINGER INC STATE COLLEGE PA
PSYCHOLOGICAL FACTORS RELATED TO TOLERANCE OF
CONFINEMENT, NOVEMBER 1967.
DESCRIPTIVE NOTE: FINAL REPT.,
NOV 67 129P NEWMILLER, C. E. ;
FRANCIS, P. S. ; COOPER, R. B. ;
REPT. NO. MRB-75111-3F

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONFINED ENVIRONMENTS,
REACTION(PSYCHOLOGY)), (*FALLOUT SHELTERS,
CONFINEMENT(PSYCHOLOGY)), CIVIL DEFENSE
SYSTEMS, BEHAVIOR, EXPERIMENTAL DESIGN,
SIMULATION, NUCLEAR WARFARE,
ADJUSTMENT(PSYCHOLOGY), ATTITUDES,
QUESTIONNAIRES, PSYCHOMETRICS,
STRESS(PSYCHOLOGY), LEADERSHIP

(U)

THE REPORT PRESENTS THE FINDINGS OF TWO SHELTER
CONFINEMENTS. TWO FIFTY-ONE-PERSON GROUPS WERE
SEPARATELY CONFINED IN A FALLOUT SHELTER FOR SIXTY-
SEVEN HOURS EACH. SEVERAL PSYCHOLOGICAL MEASURES
WERE EMPLOYED IN THE STUDY, AND THEIR APPLICABILITY
TO IT IS DISCUSSED. THE EFFECT OF A TRAINED
SHELTER MANAGER ON DEFECTIONS AND OTHER IN-SHELTER
BEHAVIOR IS ALSO PRESENTED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-667 911 13/11 13/13
PROTECTIVE STRUCTURES DEVELOPMENT CENTER FORT BELVOIR
VA
AIR DISTRIBUTION STUDIES IN MULTI-ROOM SHELTERS. (U)
DESCRIPTIVE NOTE: FINAL REPT.:
MAR 67 196P SVAERI, ODDVAR W. ;
STEIN, NORMAN I. ;
REPT. NO. PSDC-TR-(21-22)

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *VENTILATION);
VENTILATION FANS, VENTILATION DUCTS, GAS FLOW,
TEMPERATURE, CONFIGURATION, INSTRUMENTATION;
CIVIL DEFENSE SYSTEMS (U)
IDENTIFIERS: *PUNKAH (ORIENTAL) (U)

VENTILATION STUDIES FOR DETERMINING THE
EFFECTIVENESS OF MANUAL AIR MOVING DEVICES WERE
CONDUCTED IN THE MULTI-ROOM ADIABATIC MOCK-UP SHELTER
AT THE PROTECTIVE STRUCTURES DEVELOPMENT
CENTER. THE AIR MOVING DEVICES USED IN THE STUDY
WERE ADAPTED FROM THE ORIENTAL PUNKAH, A DEVICE
USED TO FAN A ROOM. THEY ARE LOW IN COST, OF
SIMPLE CONSTRUCTION, RUGGED AND DURABLE, CAN BE
STORED INDEFINITELY UNDER MOST CONDITIONS, AND ARE
CAPABLE OF CIRCULATING RELATIVELY LARGE VOLUMES OF
AIR AT EXTREMELY LOW POWER REQUIREMENTS.
OBSERVATIONS OF THE AIR DISTRIBUTION AND VELOCITY
PATTERNS WITHIN ALL SHELTER ROOMS FOR VARIOUS
CONFIGURATIONS AND VENTILATION RATES INDICATES THAT
PUNKAHs EXERT A SIGNIFICANT INFLUENCE. PUNKAHs
PROVIDE AN INEXPENSIVE, SIMPLE, DURABLE, AND
EFFICIENT METHOD OF IMPROVING THE VENTILATION AND
HABITABILITY OF FALLOUT SHELTER SPACES.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD#667 932 15/2
GEORGIA EXPERIMENT STATION EXPERIMENT
STORAGE STABILITY OF CIVIL DEFENSE SHELTER
RATIONS. (U)
DESCRIPTIVE NOTE: ANNUAL REPT. NO. 5, 21 JUN 66-20 JUN
67.
DEC 67 93P CECIL, S. R. ; WOODROOF, J.
G. ;
CONTRACT: DA-19-129-QM-2050(N)
MONITOR: USA-NLABS 68-26-GP

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
*SHELTERS), (*FOOD, STORAGE), MATERIALS,
CEREALS, MOISTURE, CARBOHYDRATES, FIBERBOARD,
CONTAINERS, BREAD, OXYGEN, FLEXURAL STRENGTH,
LEAKAGE(FLUID), CORROSION,
DEFECTS(MATERIALS), SURVIVAL,
AGING(MATERIALS), ACCEPTABILITY, WHEAT (U)
IDENTIFIERS: *PROTECTIVE COATINGS (U)

RESULTS ARE REPORTED ON THE STABILITY OF TEN LOTS
OF FALLOUT SHELTER CEREAL RATIONS STORED FOR 4 YEARS
AND 3 LOTS OF CARBOHYDRATE SUPPLEMENT STORED FOR 3
YEARS AT 100F/80% R.H., 100 DEGREES/57%, 70
DEGREES/80%, 70 DEGREES/57%, 40 DEGREES/57%,
AND 0 DEGREES/AMBIENT R.H. RATIONS INCLUDE 6 LOTS
OF SURVIVAL CRACKERS, 4 LOTS OF SURVIVAL BISCUITS, 2
LOTS OF BULGUR WHEAT WAFERS, AND 3 LOTS OF MIXED
LEMON AND CHERRY FLAVORED HARD CANDIES. DATA
INCLUDE 48-MONTH AND 36-MONTH VALUES, RESPECTIVELY,
FOR (1) BURSTING STRENGTH, MOISTURE CONTENT, AND
GENERAL CONDITIONS OF V3C FIBERBOARD CASES; (2)
RESIDUAL OXYGEN, LEAKING, CORROSION, AND COATING
DEFECTS OF 2-1/2-GALLON AND 5-GALLON METAL CANS;
(3) BREAKAGE AND GENERAL CONDITION OF PACKAGE
SEALS, SEAMS AND MATERIALS, AND PRODUCT UNITS;
(4) FRACTURE STRENGTH, PEROXIDES, AND FREE FATTY
ACIDS OF WHEAT PRODUCTS; (5) PH AND SUGAR
CONTENTS OF CARBOHYDRATE SUPPLEMENTS; AND (6)
MOISTURE CONTENT, COLOR, SENSORY QUALITY, AND HEDONIC
RATINGS FOR ALL PRODUCTS. RESULTS OF ALL
EXAMINATIONS OF STORED RATIONS, INITIALLY AND THROUGH
36 AND 48 MONTHS, ARE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-668 220 13/13 18/8 15/3
STANFORD RESEARCH INST MENLO PARK CALIF
AN ANALYSIS OF ROOF WASHDOWN VERSUS APPLIED SHIELDING
AS A FALLOUT COUNTERMEASURE, (U)
DEC 66 41P LEE, HONG ;
CONTRACT: N00228-66-C-0231
PROJ: SRI-MU-5806

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *ROOFS),
(*RADIOACTIVE FALLOUT, *DECONTAMINATION),
CIVIL DEFENSE SYSTEMS, SHIELDING, CLEANING,
RADIOLOGICAL CONTAMINATION, RADIOLOGICAL DOSAGE,
PROTECTION, RELIABILITY, COSTS (U)
IDENTIFIERS: WASHDOWN (U)

THE STUDY PROVIDES GUIDANCE ON THE BASIC
APPLICABILITY AND RELATIVE WORTH OF ROOF WASHDOWN AS
A FALLOUT RADIATION COUNTERMEASURE. THE BASIC
PURPOSE OF ROOF WASHDOWN IS TO REDUCE THE RADIATION
DOSE TO OCCUPANTS OF A BUILDING BY PREVENTING OR
REDUCING THE ACCUMULATION OF FALLOUT ON THE ROOF.
HOWEVER, THE ROOF WASHDOWN SYSTEM DOES NOT AFFECT
THE PENETRATION OF THE ROOF BY RADIATION FROM OTHER
SOURCES. IT WAS FOUND THAT UNDER SOME
CIRCUMSTANCES A ROOF WASHDOWN SYSTEM IS A USEFUL
MEANS FOR INCREASING THE PROTECTION OF BUILDING
INTERIORS AND THAT, IN GENERAL, THE COST OF A
WASHDOWN SYSTEM FOR LARGE ROOF AREA STRUCTURES WITH
SMOOTH SLOPED ROOFS WILL BE LESS THAN THE COST OF
PROVIDING AN EQUIVALENT AMOUNT OF SHIELDING.
HOWEVER, APPLIED SHIELDING PROVIDES 100 PERCENT
RELIABILITY WHEREAS ROOF WASHDOWN SYSTEMS MAY NOT BE
AS RELIABLE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-669 258 15/3 13/12
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
SPECIALIZED EVALUATIONS OF SHELTER EQUIPMENT AND
PROCEDURES. (U)
DESCRIPTIVE NOTE: FINAL REPT.
JAN 68 192P MEIER, HARRY A. ;
SMITH, ROBERT W. ; GAYNOR, MICHAEL W. ;
REPT. NO. GARD-1292-F
MONITOR: OCD 1522A

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*CONFINED ENVIRONMENTS, SURVIVAL KITS), CIVIL
DEFENSE SYSTEMS, VENTILATION DUCTS, ILLUMINATION,
TANKS(CONTAINERS), MANAGEMENT PLANNING,
MODELS(SIMULATIONS), MODEL TESTS, RADIATION
MONITORS, INSTRUCTION MANUALS, CONSTRUCTION,
PERFORMANCE(HUMAN), REACTION(PSYCHOLOGY),
QUESTIONNAIRES, FAILURE(MECHANICS), GROUP
DYNAMICS, OPERATION (U)

THREE SERIES OF TESTS EVALUATED A VENTILATION KIT,
LIGHTING KIT, AND DUAL-PURPOSE CONTAINER FOR
FUNCTIONAL ADEQUACY AND EASE OF ASSEMBLY AND
OPERATION IN SIMULATED FALLOUT SHELTER ENVIRONMENTS.
THE FIRST SERIES OF TESTS USED 2-MAN TEAMS AND
LIGHT AND DARK CONDITIONS. THE SECOND SERIES 4-MAN
TEAMS, AND THE THIRD SERIES 400 PEOPLE IN A 48 HOUR
SHELTER OCCUPANCY. THE FIRST AND SECOND TEST
SERIES EVALUATED AND REVISED ASSEMBLY AND OPERATING
INSTRUCTIONS, AND DEVELOPED SHELTER MANAGER *FOCUS
AIDES* TO ELIMINATE DIFFICULTIES DISCOVERED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-670 027 13/1 15/3
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
VENTILATION EQUIPMENT ANALYSIS FOR BASEMENT
SHELTERS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
FEB 68 270P LIS,STEPHEN J. ;
BEHLS,HERMAN F. ;
REPT. NO. GARD-1278-F

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
STANFORD RESEARCH INST., MENLO PARK, CALIF.

DESCRIPTORS: (*FALLOUT SHELTERS, *COOLING *
VENTILATING EQUIPMENT), VENTILATION, UNDERGROUND
STRUCTURES, CIVIL DEFENSE SYSTEMS, MODIFICATION
KITS, SYSTEMS ENGINEERING, STATISTICAL ANALYSIS,
PORTABLE, PROCUREMENT, DIAGRAMS, DUCTS,
VENTILATION FANS (U)
IDENTIFIERS: GRAPHS(CHARTS) (U)

SHELTER AND VENTILATOR EQUIPMENT ANALYSES WERE
PERFORMED TO DETERMINE THE BEST VENTILATOR KITS FOR
THE 138,000 BELOW-GRADE FALLOUT SHELTERS IDENTIFIED
DURING THE SECOND PHASE OF THE NATIONAL FALLOUT
SHELTER SURVEY (NFSS). THE BASIS FOR THE
STUDY WAS A RANDOM SAMPLING OF 160 FACILITIES.
SKETCHES OF THESE SHELTERS WERE ANALYZED FOR BASIC
CHARACTERISTICS THAT DEFINE THE VENTILATION
REQUIREMENTS, AND BY MATCHING THE PERFORMANCE OF OVER
600 FANS TO THE SHELTER REQUIREMENTS, THE BEST SEVEN
KITS WERE CHOSEN BASED ON A LEAST-COST VENTILATION
SYSTEM. THE FINAL SELECTION OF KITS TO BE STOCKED
DEPENDS ON CONSIDERATIONS OTHER THAN ENGINEERING,
PRIMARILY HUMAN FACTORS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-670 950 13/13 13/1
STANFORD RESEARCH INST MENLO PARK CALIF
FEASIBILITY OF LOW COST VENTILATION TECHNIQUES. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
DEC 67 93P HORI, TATSU ;
PROJ: SRI-4949-251

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *VENTILATION
FANS), COSTS, FEASIBILITY STUDIES, CIVIL
DEFENSE SYSTEMS, VENTILATION, AERODYNAMIC
CHARACTERISTICS, VENTILATION DUCTS, GAS PUMPS (U)
IDENTIFIERS: *PUNKAH (U)

THE SPECIFIC OBJECTIVE OF THE WORK PROJECT WAS TO
EVALUATE THE USE OF A PUNKAH TO DISTRIBUTE AIR WITHIN
A FALLOUT SHELTER AND TO DETERMINE ITS FLOW
CHARACTERISTICS. THE PUNKAH IS AN OSCILLATING
PANEL, WITH A SERIES OF SIMPLE ONE-WAY VALVES, THAT
CAN BE HUNG FROM A CEILING OR IN AN OPEN DOORWAY.
IN THE EXPERIMENTS, THE PUNKAH WAS USED NOT ONLY TO
DISTRIBUTE AIR WITHIN A ROOM, BUT ALSO TO MOVE AIR
FROM ONE ROOM TO ANOTHER. PUNKAHS WERE TRIED IN
VARIOUS PARTS OF THE ROOMS THAT COMPRISED THE
EXPERIMENTAL SHELTER, AND VARIOUS PANELING
CONFIGURATIONS FOR IMPROVING THE AIR DELIVERY WERE
INVESTIGATED. OF SPECIAL INTEREST WAS THE PROBLEM
OF VENTILATING A DEAD-END COMPARTMENT, THIS BEING THE
MOST DIFFICULT TYPE OF ROOM TO VENTILATE BECAUSE ITS
ONLY AIR INLET IS A SINGLE INSIDE DOORWAY. THE
INTERNAL HEAT LOAD PROVIDED WAS ALL SENSIBLE HEAT.
DRY-BULB TEMPERATURE READINGS WERE TAKEN AT SIX
ROOM LEVELS TO EVALUATE THE COOLING EFFECT OF THE
PUNKAH. THE PUNKAH WAS CAPABLE OF VENTILATING A
DEAD-END ROOM AND ALSO OF MIXING THE AIR WITHIN SUCH
A ROOM SUFFICIENTLY TO MAINTAIN A CLIMATIC CONDITION
VERY NEAR TO THAT OF THE ADJACENT ROOM. FLOW TESTS
WERE MADE ON THE HALF-DOOR SIZED PUNKAH. FOR
PURPOSES OF CONTROLLING FLOW AND PROVIDING
MEASUREMENTS OF VELOCITY AND PRESSURE, TESTS WERE
PERFORMED USING A DUCTED HOUSING. PERFORMANCE
CURVES FOR THE PUNKAH OPERATING IN FOUR DIFFERENT
MODES WERE DEVELOPED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-671 641 15/3

AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA
SHELTER MANAGEMENT ACTIVITIES IN THE INCREASED
READINESS PERIOD.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

APR 68 102P

BEND, EMIL ; JEFFREYS, FRANK

B. ;

REPT. NO. AIR-D93E-4/68-FR

MONITOR: OCD 1543A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: INCLUDES SUMMARY OF FINAL
REPORT.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
*SHELTERS), (*CIVIL DEFENSE PERSONNEL,
SHELTERS), MANAGEMENT PLANNING, FALLOUT
SHELTERS, SELECTION, OPERATIONAL READINESS,
TRAINING, PUBLIC RELATIONS, DISASTERS,
SURVIVAL, STRESS (PSYCHOLOGY),
REACTION (PSYCHOLOGY), WARNING SYSTEMS,
FEEDBACK

(U)

IDENTIFIERS: INCREASED READINESS

(U)

THIS STUDY OF SHELTER MANAGEMENT ACTIVITIES IN THE
INCREASED READINESS (IR) PHASE IS DIVIDED INTO
TWO PARTS. PART 1 CONSISTS OF RECOMMENDATIONS FOR
SM ACTIVITIES. IT COVERS: (1) SELECTION AND
RECRUITMENT OF SHELTER PERSONNEL, (2) TRAINING,
(3) PUBLIC INFORMATION, AND (4) SHELTER
PREPARATIONS DURING THE IR PERIOD. SELECTION,
RECRUITMENT, AND TRAINING GUIDELINES ARE CENTERED
ABOUT THREE LEVELS OF SHELTER STAFFING: (1)
EXECUTIVE SHELTER MANAGERS (FOR LARGE SHELTER),
(2) *REGULAR* SHELTER MANAGERS, AND (3) TASK
LEADERS-SPECIALISTS IN SELECTED SHELTER OPERATIONS
VITAL FOR SURVIVAL. PUBLIC INFORMATION GUIDELINES
DEAL WITH PREPARING IR INFORMATIONAL MATERIALS,
DISTRIBUTING AND UPDATING THEM, AND ESTABLISHING
FEEDBACK MECHANISMS. GUIDELINES TO THE PUBLIC
ABOUT SHELTER LIVING ARE DISCUSSED. SHELTER
PREPARATION GUIDELINES INCLUDE PLANNING FOR AN
OPTIMUM LARGE SHELTER CONFIGURATION OF SEMI-
AUTONOMOUS GROUPINGS OF ABOUT 300 PERSONS EACH.
THE ISSUES OF *PRIVATE PROPERTY* AND IN-SHELTER
GUIDANCE MATERIALS ARE ALSO DISCUSSED. PART 2 OF
THE REPORT CONSISTS OF A REVIEW OF THE RESEARCH
LITERATURE PERTINENT TO SHELTER MANAGEMENT ACTIVITIES
IN THE INCREASED READINESS PERIOD. THE MAJOR
TOPICS COVERED ARE STRESS AND DISASTER BEHAVIOR,
WARNINGS, AND SHELTER MANAGEMENT. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-671 703 13/2 15/3
ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR
VA
HUMAN WASTE STUDIES IN AN OCCUPIED CIVIL DEFENSE
SHELTER, (U)
OCT 65 98P DESROSIERS, PAUL E. ;
PROJ: OCD-05-63-235

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (*WASTES(SANITARY ENGINEERING),
STORAGE), HUMANS, SAMPLING, WATER,
BACTERIA, WASTE GASES, ODORS, OLEIC ACIDS,
SULFATES, GERMICIDES, CONTAINERS (U)
IDENTIFIERS: SANITARY VAULTS (U)

THE REPORT COVERS HUMAN WASTE STUDIES CONDUCTED IN
AN OCCUPIED CIVIL DEFENSE FALLOUT SHELTER
FACILITY. BOTH THE SANITARY VAULT WASTE SYSTEM AND
PREFERRED CHEMICAL ODOR CONTROL AGENT WERE EVALUATED
UNDER THESE SHELTER CONDITIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-673 078 15/2 6/18
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
CEILING-SHINE CONTRIBUTION WITHIN BUILDINGS FROM
FALLOUT RADIATION FIELD. (U)
DESCRIPTIVE NOTE: TECHNICAL STUDY IN ATOMIC DEFENSE
ENGINEERING,
FEB 63 14P LEDOUX, J. C. ;
REPT. NO. NCEL-TS-30

UNCLASSIFIED REPORT

DESCRIPTORS: (•FALLOUT SHELTERS, RADIATION
HAZARDS), DESIGN, CIVIL DEFENSE SYSTEMS,
REFLECTION, BUILDINGS, CONFIGURATION,
INSTRUCTION MANUALS, RADIOACTIVE FALLOUT,
PERMEABILITY, SHIELDING, SCATTERING,
MATHEMATICAL MODELS (U)
IDENTIFIERS: CEILING-SHINE, TOTAL RADIATION (U)

CEILING-SHINE IS THAT RADIATION WHICH ENTERS
THROUGH THE WALL OF A STRUCTURE, REFLECTS FROM THE
CEILING AND INCREASES THE RADIATION WITHIN A SHIELDED
SPACE. IN MOST CASES THE CEILING-SHINE
CONTRIBUTION IS SMALL WHEN COMPARED TO DIRECT AND
WALL-SCATTERED RADIATION. IN SOME CASES IT CAN BE
AN IMPORTANT CONTRIBUTION. THE PRESENT METHOD OF
ANALYZING BUILDINGS, THE ENGINEERING MANUAL, OCD
PM 100-1, INCLUDES THE CEILING-SHINE EFFECT IN THE
AIR SCATTERED CONTRIBUTION, BUT DOES NOT PROVIDE A
SEPARATE METHOD OF ANALYSIS. THIS REPORT DISCUSSES
THE THEORY AND APPLICATION OF CEILING-SHINE AND
PROPOSES A METHOD OF COMPUTING ITS CONTRIBUTION.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-673 722 15/3 13/13 5/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
A STUDY OF THE ADOPTION-DIFFUSION PROCESS IN THE
DEVELOPMENT OF SHELTER IN NEW CONSTRUCTION. (U)
DESCRIPTIVE NOTE: TECHNICAL MEMO.,
JUN 68 73P STREICH, EUGENE R. ;
WELLISHCH, JEAN B. ;
REPT. NO. SDC-TM-3892/001/00
CONTRACT: DAHC20-67-C-0178

UNCLASSIFIED REPORT

DESCRIPTORS: (•FALLOUT SHELTERS, •BUILDINGS),
(•CIVIL DEFENSE SYSTEMS, FALLOUT SHELTERS),
DESIGN, COMMUNICATION SYSTEMS, DIFFUSION,
EDUCATION, SOCIAL COMMUNICATION, RADIOACTIVE
FALLOUT, NUCLEAR RADIATION, SHOCK WAVES,
PROTECTION, BLAST (U)
IDENTIFIERS: SLANTING TECHNIQUES,
INNOVATION(TECHNOLOGY), OVERPRESSURE (U)

A STUDY OF THE DIFFUSION PROCESS INVOLVED IN
IMPLEMENTING CIVIL DEFENSE PROGRAMS DIRECTED TOWARD
ENCOURAGING THE INCORPORATION OF FALLOUT SHELTER IN
NEW CONSTRUCTION WAS PERFORMED. THE THEORETICAL
LITERATURE ON DIFFUSION-ADOPTION PROCESSES CONCERNING
THE ADOPTION OR REJECTION OF INNOVATIONS WAS EXAMINED
FOR APPLICABILITY, THE ACTUAL PROGRAM IMPLEMENTATION
PROCESS WAS EXAMINED, AND TO DETERMINE THE
EFFECTIVENESS OF PROGRAM IMPLEMENTATION MEASURES.
INTERVIEWS WERE CONDUCTED WITH BOTH PROGRAM PERSONNEL
AND POTENTIAL ADOPTERS -- BUILDING OWNERS AND
ARCHITECTS -- IN TWO CIVIL DEFENSE REGIONS.
AN ANALYSIS OF THE DATA WAS MADE, RESULTS
DESCRIBED, AND SUGGESTIONS FOR FURTHER STUDY
PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-673 778 15/3

GEORGIA UNIV ATHENS CIVIL DEFENSE RESEARCH
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA.

DESCRIPTIVE NOTE: FINAL REPT.,

DEC 67 329P HAMMES, JOHN A. ;

AHEARN, THOMAS R. ;

CONTRACT: DAHC20-67-C-0144

PROJ: OCD-1500

TASK: 1520

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (FALLOUT SHELTERS, MANAGEMENT
PLANNING), CONFINED ENVIRONMENTS, CIVIL DEFENSE
SYSTEMS, CIVIL DEFENSE PERSONNEL, TRAINING,
PERSONNEL MANAGEMENT, QUESTIONNAIRES, HANDBOOKS,
FOOD, SANITARY ENGINEERING, MEDICAL SUPPLIES
IDENTIFIERS: HABITABILITY

(U)
(U)

IN 1967 THE CIVIL DEFENSE RESEARCH STAFF AT
THE UNIVERSITY OF GEORGIA CONDUCTED TWO SIMULATED
FALLOUT SHELTER OCCUPANCY STUDIES; ONE, A 722-PERSON
TEST, AND THE OTHER, A 1,046-PERSON TEST. MEN,
WOMEN, AND CHILDREN, AGED 6 MONTHS TO 76 YEARS,
PARTICIPATED. DETAILED FINDINGS ARE PRESENTED IN
THIS REPORT, AS WELL AS A STUDY OUTLINE OF A 2-HOUR
EMERGENCY SHELTER MANAGEMENT TRAINING COURSE.
(AUTHOR)

(U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-673 817 6/8 15/3 13/13

GEORGIA EXPERIMENT STATION EXPERIMENT
STORAGE STABILITY OF CIVIL DEFENSE SHELTER
RATIONS.

(U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 6, 1 JUL 67-30 JUN
68,

JUN 68 71P CECIL, SAM R. I

REPT. NO. 156-VI-GES

CONTRACT: DAHC20-67-C-0136

UNCLASSIFIED REPORT

DESCRIPTORS: (*FOOD, SURVIVAL KITS),
(*STORAGE, AGING(MATERIALS)), STOCK LEVEL
CONTROL, FOOD DISPENSING, CEREALS, BREAD,
STABILITY, ODORS, MOISTURE, DEGRADATION,
TEMPERATURE, PH, PEROXIDES, TASTE,
STATISTICAL ANALYSIS, CIVIL DEFENSE SYSTEMS,
FALLOUT SHELTERS, CONTAINERS
IDENTIFIERS: FLAVORS, *SHELTER RATIONS

(U)

(U)

RESULTS ARE REPORTED ON THE STABILITY OF TEN LOTS
OF FALLOUT SHELTER CEREAL RATIONS STORED FOR 5 YEARS
AND 3 LOTS OF CARBOHYDRATE SUPPLEMENT STORED FOR 4
YEARS. RATIONS INCLUDE 4 LOTS OF SURVIVAL
CRACKERS, 4 LOTS OF SURVIVAL BISCUITS, 2 LOTS OF
BULGUR WHEAT WAFERS, AND 3 LOTS OF MIXED LEMON AND
CHERRY FLAVORED HARD CANDIES. DATA INCLUDE 60-
MONTH AND 48-MONTH VALUES, RESPECTIVELY, FOR (1)
BURSTING STRENGTH, MOISTURE CONTENT, AND GENERAL
CONDITIONS OF VJC FIBER BOARD CASES; (2)
RESIDUAL OXYGEN, LEAKING, CORROSION, AND COATING
DEFECTS OF 2 1/2-GALLON AND 5-GALLON METAL CANS;
(3) BREAKAGE AND GENERAL CONDITION OF PACKAGE
SEALS, SEAMS, MATERIALS, AND PRODUCTS UNITS; (4)
FRACTURE STRENGTH, PEROXIDES, AND FREE FATTY ACIDS OF
WHEAT PRODUCTS; (5) PH AND SUGAR CONTENTS OF
CARBOHYDRATE SUPPLEMENTS; AND (6) MOISTURE
CONTENT, COLOR, SENSORY QUALITY, AND HEDONIC RATINGS
FOR ALL PRODUCTS. RESULTS OF PREVIOUS EXAMINATIONS
OF STORED RATIONS ARE DISCUSSED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-674 254 15/2 13/13 16/3
BECHTEL CORP GAITHERSBURG MD
PROTECTIVE BLAST SHELTER SYSTEM ANALYSIS DETROIT,
MICHIGAN. (U)
DESCRIPTIVE NOTE: FINAL REPT.
JUN 68 324P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPPORTED IN PART BY OFFICE OF
CIVIL DEFENSE, WASHINGTON, D. C.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
MICHIGAN), (*NUCLEAR EXPLOSIONS, *SHELTERS),
SITE SELECTION, WATER SUPPLIES, CONCRETE,
BLAST, PROTECTION, DESIGN, UNDERGROUND
STRUCTURES, POPULATION, URBAN AREAS, COSTS,
FIRES, CONSTRUCTION, HAZARDS, SOILS, SYSTEMS
ENGINEERING, NUCLEAR EXPLOSIONS, STRUCTURAL
PROPERTIES, FEASIBILITY STUDIES, STATISTICAL
ANALYSIS (U)
IDENTIFIERS: OVERPRESSURE, YIELD(NUCLEAR
EXPLOSIONS) (U)

THE PURPOSE OF THE STUDY IS TO DETERMINE THE
PROBLEMS INVOLVED IN SELECTING, ACQUIRING, AND
UTILIZING SITES FOR A SYSTEM OF SHELTERS DESIGNED TO
PROVIDE A UNIFORM LEVEL OF BLAST PROTECTION FOR THE
ENTIRE POPULATION OF DETROIT, MICHIGAN.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BHL27

AD-674 663 13/13 6/11 18/3
IIT RESEARCH INST CHICAGO ILL
CIVIL DEFENSE SHELTER OPTIONS FOR FALLOUT AND BLAST
PROTECTION (SINGLE-PURPOSE). (U)
DESCRIPTIVE NOTE: FINAL REPT. MAR 67-FEB 68,
JUN 68 220P LONGINOW, ANATOLE I
STEPANEK, OTTO J. ;
CONTRACT: DAHC20-67-C-0167
PROJ: IITRI-J6115

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, NUCLEAR EXPLOSIONS),
(*CIVIL DEFENSE SYSTEMS, SHELTERS), URBAN
AREAS, RADIOACTIVE FALLOUT, BLAST, DESIGN,
COSTS, HEMISPHERICAL SHELLS, SITE SELECTION,
SOILS, LIFE SUPPORT, UNDERGROUND STRUCTURES,
LOADING(MECHANICS), VOLUME, MATERIALS,
DOORS, SURVIVAL, PROTECTION, HARDENING (U)
IDENTIFIERS: *BASEMENT SHELTERS, OVERPRESSURE (U)

THE OBJECTIVE OF THIS STUDY WAS TO DEVELOP DATA ON
SHELTER CONCEPTS, COSTS AND PROTECTIVE CAPABILITIES
OF SINGLE-PURPOSE SHELTERS CAPABLE OF DEPLOYMENT IN
URBAN AND/OR PERIPHERAL REGIONS. TWO CATEGORIES OF
SHELTER STRUCTURES WERE CONSIDERED, 'PERMANENT' AND
'EXPEDIENT.' THE FORMER ARE THOSE SHELTERS
REQUIRING SPECIALIZED SKILLS, EQUIPMENT,
COMMUNICATION AND SUPPLY ROUTES, ETC.; THE LATTER ARE
CAPABLE OF BEING CONSTRUCTED RAPIDLY BY UNSKILLED OR
SEMISKILLED LABOR, USING LITTLE OR NO SPECIALIZED
EQUIPMENT. THE EFFORT WAS PRIMARILY CONCERNED WITH
PERMANENT SHELTERS. EACH STRUCTURE TYPE WAS
DESIGNED AND COSTED FOR THREE SHELTER LOCATIONS
RELATIVE TO THE GROUND SURFACE, SIX HABITABILITY
OPTIONS AND FOUR NUCLEAR WEAPONS ENVIRONMENTS
CHARACTERIZED BY FALLOUT RADIATION ALONE, AND 10, 20
AND 30 PSI FREE FIELD OVERPRESSURE AND ASSOCIATED
EFFECTS RESULTING FROM MEGATON RANGE NUCLEAR WEAPONS.
A TOTAL OF 864 SHELTER COST OPTIONS ARE PRESENTED.
A COST INVESTIGATION OF BASEMENT SHELTERS IS
INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-675 410 18/8 13/13
ARMY NUCLEAR DEFENSE LAB EDGEWOOD ARSENAL MD
CALCULATIONS WITH UNC-SAM-2 OF EXPOSURE RATES
MEASURED IN AN OPEN BASEMENT, (U)
JUL 68 22P BUHL, A. R. LACETERA, JANET
E. ;
REPT. NO. NDL-TM-44
PROJ: DA-1-B-022601-A-089
TASK: 1-B-022601-A-08901

UNCLASSIFIED REPORT

DESCRIPTORS: (•UNDERGROUND STRUCTURES,
RADIOACTIVE FALLOUT), DOSE RATE, SHIELDING,
CIVIL DEFENSE SYSTEMS, MODELS(SIMULATIONS),
DETECTORS, PROBABILITY, MONTE CARLO METHOD,
PROGRAMMING(COMPUTERS), DIGITAL COMPUTERS,
NUMERICAL METHODS AND PROCEDURES (U)
IDENTIFIERS: GRAPHS(CHARTS), OPEN BASEMENTS,
UNC/SAM 2 PROGRAMMING LANGUAGE (U)

A NUMBER OF EXPERIMENTAL STUDIES ARE BEING
CONDUCTED TO VALIDATE THEORETICAL METHODS OF
CALCULATING FALLOUT PROTECTION AFFORDED BY
STRUCTURES. AS A PART OF THIS PROGRAM, EXPOSURE
RATES IN AN OPEN BASEMENT WERE MEASURED AT THE US
ARMY NUCLEAR DEFENSE LABORATORY (USANDL).
THIS REPORT PRESENTS CALCULATED EXPOSURE RATES FOR
FORTY-EIGHT DETECTORS LOCATED WITHIN THE OPEN
BASEMENT. THESE RESULTS WERE OBTAINED USING UNC-
SAM-2, A MONTE CARLO RADIATION TRANSPORT
DIGITAL COMPUTER CODE. THE CALCULATED RESULTS ARE
COMPARED WITH EXPERIMENTAL MEASUREMENTS AND ALSO WITH
COMPARABLE ADJOINT (MONTE CARLO) RESULTS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-675 466 15/3 18/6 9/2
OAK RIDGE NATIONAL LAB TENN
A COMPARISON OF THE BUILDING PROTECTION FACTOR CODES
CAPS-2 AND PF-COMP. (U)
DESCRIPTIVE NOTE: FINAL REPT.:
JUL 68 61P GRITZNER, M. L. STEVENS, P.
N. ;
REPT. NO. ORNL-TM-2285

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPPORTED IN PART BY OFFICE OF
CIVIL DEFENSE, WASHINGTON, D.C.

DESCRIPTORS: (*FALLOUT SHELTERS, PROTECTION),
(*SHIELDING, PROGRAMMING(COMPUTERS)),
DESIGN, CORRELATION TECHNIQUES, WALLS, FLOORS,
CIVIL DEFENSE SYSTEMS (U)
IDENTIFIERS: PF-COMP COMPUTER PROGRAM, CAPS-2
COMPUTER PROGRAM, COMPUTER AIDED DESIGN (U)

THE RELATIVE MERITS OF TWO COMPUTER CODES, PF-COMP AND CAPS-2, FOR CALCULATING RADIATION FALLOUT PROTECTION FACTORS FOR SHELTER AREAS WERE INVESTIGATED BY COMPARING THE CODE RESULTS WITH THOSE FROM HAND CALCULATIONS BASED ON THE ENGINEERING MANUAL METHOD. FIVE BUILDING TYPES WERE CONSIDERED. FOR PROTECTION FACTORS IN THE RANGE OF 1 TO 100, THE PF-COMP CODE WAS FOUND TO YIELD VALUES THAT WERE WITHIN PLUS OR MINUS 15% OF THE HAND-CALCULATED VALUES, WHILE THE CAPS-2 CODE GAVE RESULTS THAT WERE WITHIN -44 TO +88% OF THE HAND-CALCULATED VALUES. FOR PROTECTION FACTORS GREATER THAN 100, THE PF-COMP CODE RESULTS WERE WITHIN -41 TO +36% AND THE CAPS-2 CODE RESULTS WERE WITHIN -10 TO -58% OF THE HAND-CALCULATED VALUES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-676 183 15/6 13/13 15/3
IIT RESEARCH INST CHICAGO ILL
CASUALTY PREDICTION COMPARISONS.
DESCRIPTIVE NOTE: FINAL REPT.,
JUL 68 55P FEINSTEIN, D. I. ;
CONTRACT: DAHC20-67-C-0167
PROJ: IITRI-J6114

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, PROTECTION),
(NUCLEAR WARFARE CASUALTIES, POSTURE),
(*POSTURE, SURVIVAL); PREDICTIONS,
EFFECTIVENESS, CONFIGURATION, SURFACE BURST,
BUILDINGS, BRICK, WOOD, STEEL, DEBRIS,
MORTALITY RATES, WOUNDS * INJURIES, CIVIL
DEFENSE SYSTEMS

(U)

THE STUDY UTILIZED A PREVIOUSLY DEVELOPED COMPUTER
MODEL, THE SHELTER EVALUATION PROGRAM (SEP)
CODE, TO INVESTIGATE THE EFFECTIVENESS OF VARIOUS
SHELTER CONFIGURATIONS AND OCCUPANT POSTURES WITH
REGARD TO RESISTING THE DIRECT EFFECTS OF A 10 MT
SURFACE BURST OVER A RANGE OF INCIDENT PRESSURE
LEVELS. THE SHELTER CONFIGURATIONS INCLUDE WOOD
FRAME SINGLE-STORY AND TWO-STORY, LOAD BEARING BRICK
WALL THREE-STORY RESIDENTIAL, SEVEN-STORY BRICK LOAD
BEARING WALL (WAREHOUSE), SIX-STORY STEEL FRAME
CURTAIN WALL COMMERCIAL, AND NO SHELTER OUTSIDE
CASES. SHELTER OCCUPANTS WERE CONSIDERED IN TWO
POSTURES; STANDING AND PRONE. RESULTS INDICATE
THAT THERE IS A SIGNIFICANT REDUCTION IN CASUALTIES
WHEN SHELTER OCCUPANTS ARE IN A PRONE STATE.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-676 221 13/13 15/3
STANFORD RESEARCH INST MENLO PARK CALIF
CONSTRUCTION RESOURCES AVAILABILITY IN SUPPORT OF
BLAST SHELTER PROGRAMS. (U)
DESCRIPTIVE NOTE: FINAL REPT.:
MAY 68 212P CURIONE, CHARLES I
DICKMAN, ROBERT I DOUGLAS, JAMES I KRAKOW, HERBERT I
CONTRACT: DAHC20-67-C-0136
PROJ: SRI-MU-6300-040

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHELTERS, CONSTRUCTION),
(*CIVIL DEFENSE SYSTEMS, SHELTERS), ECONOMICS,
POPULATION, CONSTRUCTION MATERIALS, PREDICTIONS,
FALLOUT SHELTERS, BLAST, COSTS, MANPOWER,
DESIGN, RESEARCH PROGRAM ADMINISTRATION,
INDUSTRIAL PRODUCTION, TIME, EARTH-HANDLING
EQUIPMENT, SMALL TOOLS (U)
IDENTIFIERS: REAL ESTATE (U)

THE PRIMARY OBJECTIVE OF THIS STUDY WAS TO EVALUATE
THE IMPACT OF A NATIONAL BLAST SHELTER ON THE
CONSTRUCTION INDUSTRY RESOURCES IN THE UNITED
STATES. SEVEN NATIONAL SHELTER PROGRAMS WERE
ASSUMED, EACH IN INCREASING ORDER CAPABLE OF
PROVIDING A HIGHER DEGREE OF PROTECTION.
POPULATION WAS PROJECTED. EACH PROGRAM WAS
COSTED IN DOLLARS FOR THAT PORTION OF THE POPULATION
PROTECTED AS DISTRIBUTED AND PROJECTED FOR 1965,
1970, AND 1975. DATA RELATED TO CAPACITY OF
CONSTRUCTION, DESIGN, MATERIAL AND EQUIPMENT,
AVAILABLE AND USEFUL REAL ESTATE, AND OTHER RESOURCES
WERE COLLECTED AND ADJUSTED TO A COMMON DESCRIPTOR,
DOLLARS. THE DOLLARS WERE THEN PRESENTED FOR BASE
YEAR 1965 AND FOR YEARS 1970 AND 1975. THE
REQUIREMENTS WERE THEN BALANCED AGAINST THE AVAILABLE
RESOURCES AND THE DEFICITS NOTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-676 852 5/9 15/3 13/13
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA
EXPANSION OF RESEARCH DATA FROM SHELTER OCCUPANCY
EXERCISES. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
AUG 68 98P COLLINS, ROBERT A. ;
BEND, EMIL ;
REPT. NO. AIR-F26-8/68-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
*TRAINING), FALLOUT SHELTERS, STUDENTS,
QUESTIONNAIRES, SOCIOMETRICS, DATA, COLLECTING
METHODS, DATA PROCESSING SYSTEMS, MANAGEMENT
ENGINEERING (U)
IDENTIFIERS: HABITABILITY, *SHELTER EXERCISES (U)

THE REPORT DESCRIBES THE RESULTS OF THE
CONTINUATION OF A PROJECT TO COLLECT AND ANALYZE
HABITABILITY DATA FROM SHELTER EXERCISES HELD IN
CONJUNCTION WITH CIVIL DEFENSE TRAINING COURSES.
ABOUT 1,300 QUESTIONNAIRES WERE RECEIVED FROM
STUDENTS, MOSTLY ASSOCIATED WITH CDUEP COURSES.
IN ADDITION, 60 INSTRUCTOR FORMS, IN WHICH
INSTRUCTORS SUMMARIZED THEIR RECENT SHELTER EXERCISE
EXPERIENCES, WERE RETURNED TO AIR. AMONG THE
INDEPENDENT VARIABLES THAT WERE CONSIDERED IN THE
ANALYSIS WERE: (1) SHELTEREES PRIOR EXPECTATIONS
OF THE SHELTER STAY, (2) LENGTH OF SHELTER STAY,
(3) GEOGRAPHICAL AREA, AND (4) SEX OF THE
STUDENT. AS A SECOND PART OF THE REPORT, AN
EXPERIMENTAL SHELTEREE REGISTRATION FORM FOR USE IN
LARGE SHELTERS IS DESCRIBED. THIS FORM CAN BE
FILLED OUT IN THE ABSENCE OF WRITING IMPLEMENTS AND
ALSO PROVIDES A MODEST DATA HANDLING CAPABILITY FOR
THE SHELTER ADMINISTRATION TEAM. THE REGISTRATION
FORM CAN BE USED FOR RESEARCH PURPOSES IN EXERCISES,
AS WELL AS STOCKED FOR USE IN SHELTERS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD#676 857 15/3

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
MEASURES OF WARNING EFFECTIVENESS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

MAR 68 79P GAYDOS, HENRY F. ;

MILLER, BILL D. ; NEILSON, JOHN O. ;

REPT. NO. SDC-TM-L-3390/003/01

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, WARNING
SYSTEMS), EFFECTIVENESS, MATHEMATICAL MODELS,
SHELTERS, POPULATION

(U)

THE REPORT PRESENTS AN ANALYSIS OF THE FUNDAMENTAL
VARIABLE RELEVANT TO THE CONSTRUCTION OF A MODEL FOR
MEASURING WARNING EFFECTIVENESS. INCLUDED IS A
CRITIQUE OF AN EXISTING MODEL AND SUGGESTIONS FOR A
MORE DIRECT APPROACH TO THE PROBLEM OF MEASUREMENT.
ALSO DISCUSSED ARE THE PROBLEMS OF MOVEMENT TO
SHELTER IN THE CONTEXTS OF VARIOUS ENVIRONMENTAL
CONDITIONS AND THEIR IMPLICATIONS WITH RESPECT TO
REQUIREMENTS FOR A COMPREHENSIVE MOVEMENT TO SHELTER
MODEL. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-679 874 13/1 13/13 15/3
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERA
AMERICAN RESEARCH DIV
ADEQUACY OF EVAPORATIVE COOLING AND SHELTER
ENVIRONMENTAL PREDICTION. (U)
DESCRIPTIVE NOTE: FINAL REPT. 14 FEB 67-30 JUN 68,
JUN 68 310P BASCHIERE, RONALD J. ;
RATHMANN, CARL E. ;LOKMANHEKIM, METIN ;
REPT. NO. GARD-1423-F

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
STANFORD RESEARCH INST., MENLO PARK, CALIF.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, FALLOUT
SHELTERS), (*FALLOUT SHELTERS, VENTILATION),
HANDBOOKS, CARBON DIOXIDE, HEAT TRANSFER,
TOXICITY, COOLING, EVAPORATION, HUMIDITY,
MATHEMATICAL MODELS, MAP PROJECTION, UNDERGROUND
STRUCTURES, TABLES (U)
IDENTIFIERS: GRAPHS(CHARTS) (U)

THE FEASIBILITY OF EMPLOYING EVAPORATIVE COOLERS IN
RELIEVING THERMAL STRESSES IN FALLOUT SHELTERS IS
INVESTIGATED, AND THE EFFECTS OF PLACING THE DEVICES
AT VARIOUS POINTS IN A SHELTER VENTILATION SYSTEM ARE
COMPARED. FORCED VENTILATION RATES USING
EVAPORATIVE COOLING ARE PRESENTED ALONG WITH NATIONAL
MAPS OF ISOVENTILATION CONTOURS. ADEQUACY CURVES
OF FORCED VENTILATION WITH EVAPORATIVE COOLING ARE
ALSO INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-680 936 13/13 13/12 15/3

VERTEX CORP KENSINGTON MD

PROTECTIVE CAPABILITY OF THE NATIONAL FALLOUT
SHELTER SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

NOV 68 108P CHILDERS, H. MALCOLM ;

VANSANT, CARL A. ; MOKRAUER, DONALD F. ;

REPT. NO. VERTEX-TR-68-2

CONTRACT: DAHC20-67-C-0148

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *SAFETY),
PROTECTION, CIVIL DEFENSE SYSTEMS, DEBRIS,
EXPLOSION EFFECTS, NUCLEAR EXPLOSIONS, NUCLEAR
WARFARE CASUALTIES, CLASSIFICATION, HAZARDS,
STANDARDS, BURNS, ACCELERATION, THERMAL
RADIATION, STRUCTURAL PARTS (U)

IDENTIFIERS: OVERPRESSURE (U)

THE NATURE OF THE HAZARDS DUE TO THE PROMPT EFFECTS
OF NUCLEAR WEAPON DETONATIONS ARE ANALYZED.
HAZARDS DUE TO THERMAL RADIATION, NUCLEAR
RADIATION, OVERPRESSURE, TRANSLATION, ACCELERATION,
AND DEBRIS ARE CONSIDERED. A CLASSIFICATION SCHEME
FOR ESTIMATING THE CASUALTIES WITHIN NFSS SHELTERS
IS DEvised. A SAMPLE NFSS SHELTER IS CLASSIFIED
TO ILLUSTRATE THE APPLICATION OF THE CLASSIFICATION
SCHEME. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-682 713 13/13 13/1
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL
AMERICAN RESEARCH DIV
SHELTER PORTABLE VENTILATION EQUIPMENT. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JAN 69 57P LIBOVICZ, BASIL A. ;
REPT. NO. GARD-1430

UNCLASSIFIED REPORT

DESCRIPTORS: (FALLOUT SHELTERS, VENTILATION
FANS), CIVIL DEFENSE SYSTEMS, VENTILATION DUCTS,
PORTABLE, COSTS, MAN-MACHINE SYSTEMS, FANS,
FEASIBILITY STUDIES, GAS FLOW, ELECTRIC
MOTORS (U)
IDENTIFIERS: EVALUATION (U)

THE REPORT DESCRIBES THREE SHELTER PORTABLE
VENTILATORS: A ONE-MAN PEDAL DRIVE UNIT; A FOUR-
MAN PEDAL DRIVE UNIT; A 5-HORSEPOWER ELECTRIC MOTOR-
DRIVEN UNIT. THESE VENTILATORS USE 36-INCH
DIAMETER PROPELLER FANS. ALSO INVESTIGATED WERE
THE PRESSURE LOSS CHARACTERISTICS OF 36-INCH DIAMETER
COLLAPSIBLE PLASTIC DUCT TO BE USED WITH THESE
VENTILATORS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-682 906 15/3

OAK RIDGE NATIONAL LAB TENN

ANNUAL PROGRESS REPORT, CIVIL DEFENSE RESEARCH
PROJECT, MARCH 1967-MARCH 1968. (U)

NOV 68 426P

REPT. NO. ORNL-4284-PT-1

CONTRACT: W-7405-ENG-26

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPT. NO. ORNL-TH-1531
DATED MAR 66.

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS; ADVANCED
PLANNING); SHELTERS; UNDERGROUND STRUCTURES;
COSTS; POPULATION; BEHAVIOR; TECHNICAL
INFORMATION CENTERS; BIOLOGICAL WARFARE AGENTS;
DETONATION WAVES; BLAST; NUCLEAR REACTORS;
ATTITUDES; STATISTICAL ANALYSIS; ECONOMICS;
VULNERABILITY; FOOD (U)

IDENTIFIERS: INFORMATION CENTERS; BLAST SHELTERS;
OVERPRESSURE; POSTATTACK RECOVERY; TUNNELS (U)

CONTENTS: CIVIL DEFENSE SYSTEMS ANALYSIS;
CIVIL DEFENSE PROTECTIVE SYSTEMS; WEAPONS
EFFECTS; SOCIAL ASPECTS OF CIVIL DEFENSE; AND
POSTATTACK RECOVERY. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-683 484 5/10 15/3
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA
THE EFFECTS OF EXPECTATIONS ON SHELTERED
BEHAVIOR.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 68 88P SMITH, ROBERT W. ;
MEAGLEY, DONALD E. ;
REPT. NO. AIR-705-12/68-FR

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONFINED ENVIRONMENTS,
STRESS(PSYCHOLOGY)), (*PERFORMANCE(HUMAN),
PREDICTIONS), SHELTERS, BEHAVIOR, ATTITUDES,
GROUP DYNAMICS, TEST METHODS, INTERACTIONS,
PSYCHOMETRICS, ADJUSTMENT(PSYCHOLOGY),
ENVIRONMENT, CORRELATION TECHNIQUES, CIVIL
DEFENSE SYSTEMS

(U)

IDENTIFIERS: EXPECTATION, HABITABILITY

(U)

THE RESEARCH PROGRAM REPORTED WAS DESIGNED TO
DETERMINE HOW THE INTERACTION OF EXPECTATIONS OF
SHELTER CONDITIONS WITH ACTUAL SHELTER CONDITIONS
RELATES TO SHELTEREE BEHAVIOR. IT WAS HYPOTHESIZED
THAT POOR SHELTEREE ADJUSTMENT MAY OFTEN BE
ATTRIBUTED TO AN INDIVIDUAL'S ENCOUNTER WITH
CONDITIONS MORE UNPLEASANT THAN HE EXPECTED. FOUR
24-HOUR HABITABILITY STUDIES WERE CONDUCTED, TWO WITH
FEDERAL SHELTER STOCKS (*BASIC* CONDITIONS),
AND TWO WITH HEAVILY *SUPPLEMENTED* STOCKS. EACH
STUDY CONTAINED A GROUP OF SUBJECTS WHO EXPECTED
SUPPLEMENTED CONDITIONS, AND ANOTHER WITH BASIC
EXPECTATIONS, AS MEASURED AT SHELTER ENTRY. THESE
SETS OF EXPECTATIONS WERE ACHIEVED THROUGH SELECTION,
AND THROUGH DIFFERENTIAL ORIENTATIONS.
QUANTITATIVE COMPARISONS BETWEEN EXPERIMENTAL
CONDITIONS WERE BASED ON BEHAVIOR MEASURES, AND ON
ATTITUDE SCALES. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-683 487 5/1 15/3
AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA
RESEARCH PROGRAM FOR LARGE SHELTER MANAGEMENT. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JAN 69 131P HALE, JOHN F. ;
REPT. NO. AIR-613-1/69-FR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SPONSORED IN PART BY OFFICE OF
CIVIL DEFENSE, WASHINGTON, D. C.

DESCRIPTORS: (SHELTERS, MANAGEMENT PLANNING),
CIVIL DEFENSE SYSTEMS, PSYCHOMETRICS, RESEARCH
PROGRAM ADMINISTRATION, GAME THEORY,
MODELS(SIMULATIONS), GROUP DYNAMICS,
FEASIBILITY STUDIES, PREDICTIONS,
PERFORMANCE(HUMAN), EFFECTIVENESS (U)

THE PURPOSE AND SCOPE OF THE WORK WAS TWOFOLD:
(1) TO FURTHER DEVELOP AND TEST THE SHELTER
MANAGEMENT CONTINGENCY GAME AS A RESEARCH DEVICE,
EMPHASIZING THE REALISTIC PRESENTATION OF PROBLEMS
RELATED TO THE OPERATION OF A LARGE SHELTER TO A
MANAGEMENT CADRE INHABITING A SMALL PORTION OF THE
SIMULATED LARGE SHELTER. (2) TO INVESTIGATE
THE FEASIBILITY OF THE DEVELOPMENT OF A PREDICTIVE
MODEL OF THE LARGE SHELTER. THE RESULTS INDICATE
THAT THE DEVELOPMENT OF SUCH A MODEL IS FEASIBLE, AND
IS USEFUL IN TERMS OF COMPILING AND ORDERING EXISTING
DATA AND INDICATING WHERE FURTHER RESEARCH MAY BE
DIRECTED PROFITABLY. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AC-684 947 15/3

TECHNICAL OPERATIONS INC BURLINGTON MASS
PLANNING DOCUMENT FOR THE RADIATION TEST FACILITY OF
THE PROTECTIVE STRUCTURES DEVELOPMENT CENTER. (U)
APR 63 76P BATTER, JOHN F. ;

STARBIRD, ALBERT W. ;
REPT. NO. TO-8-63-4-REV
CONTRACT: DA-18-020-ENG-1929

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (*SHELTERS, TEST FACILITIES),
STRUCTURES, FEASIBILITY STUDIES,
MODELS(SIMULATIONS), RADIOACTIVE FALLOUT,
CIVIL DEFENSE PERSONNEL, TRAINING, TRAINING
DEVICES, CALIBRATION, SITE SELECTION,
INSTRUMENTATION (U)

THIS DOCUMENT IS DESIGNED TO PROVIDE THE BACKUP
INFORMATION REQUIRED FOR THE SUCCESSFUL OPERATION OF
THE RADIATION TEST AREA OF THE NATIONAL
PROTECTIVE STRUCTURES DEVELOPMENT CENTER.
AS SUCH IT IS AN ASSEMBLAGE OF THE KNOWLEDGE AND
EXPERIENCE GAINED FROM FIVE YEARS OF TESTING BOTH
FULL-SCALE AND MODEL STRUCTURES IN A SIMULATED
FALLOUT ENVIRONMENT TOGETHER WITH GENERAL
RECOMMENDATIONS FOR TEST PROCEDURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-685 869 15/3

RESEARCH TRIANGLE INST DURHAM N C
STATISTICAL ANALYSIS OF NFSS PROTECTION
CATEGORIES.

(U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 66-DEC 68,
DEC 68 137P LYDAY, R. O. IBOTKIN, G.
M. MILL, E. L. ICSBRECH, F. G. ;
REPT. NO. RTI-R-OU-295

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
STANFORD RESEARCH INST., MENLO PARK, CALIF.

DESCRIPTORS: (*NUCLEAR WARFARE, PROTECTION),
(*BUILDINGS, STATISTICAL ANALYSIS),
RADIOACTIVE FALLOUT, NUCLEAR RADIATION,
SHELTERS, DATA, CIVIL DEFENSE SYSTEMS,
PROGRAMMING(COMPUTERS)

(U)

IDENTIFIERS: NFSS(NATIONAL FALLOUT SHELTER
SURVEY), NATIONAL FALLOUT SHELTER SURVEY,
EVALUATION

(U)

THE NATIONAL FALLOUT SHELTER SURVEY
(NFSS) WAS DESIGNED TO IDENTIFY FALLOUT SHELTER
SPACE IN ALL BUILDINGS OTHER THAN SINGLE FAMILY
DWELLINGS. BEFORE FEBRUARY 1967, PHASE 1 OF
THE NFSS USED A COMPUTER PROGRAM AT THE NATIONAL
BUREAU OF STANDARDS (NBS) TO OBTAIN A FIRST
ESTIMATE OF THE PROTECTION FACTORS IN THE BUILDINGS,
AND PHASE 2 WAS A FOLLOW-UP TO MORE COMPLETELY
IDENTIFY AND LOCATE THE PROBABLE SHELTER AREAS IN THE
BUILDINGS. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-685 870 13/13 15/3
RESEARCH TRIANGLE INST DURHAM N C OPERATIONS RESEARCH AND
ECONOMICS DIV
STATISTICAL ANALYSIS OF NFSS PROTECTION CATEGORIES:
SUMMARY, (U)
DEC 68 9P LYDAY, RUSSELL O. , JR.;
BOTKIN, G. M. ; HILL, EDWARD L. ; GIESBRECHT, F.
G. ;
REPT. NO. RTI-R-OU-295-SUMMARY

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
STANFORD RESEARCH INST., MENLO PARK, CALIF.
SPONSORED IN PART BY OFFICE OF CIVIL DEFENSE,
WASHINGTON, D. C.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (*SHELTERS, STATISTICAL
ANALYSIS), STRUCTURAL PROPERTIES, BUILDINGS,
POPULATION, PROTECTION (U)
IDENTIFIERS: NFSS (NATIONAL FALLOUT SHELTER
SURVEY), NATIONAL FALLOUT SHELTER SURVEY (U)

THE OBJECTIVE OF THE RESEARCH WAS TO DETERMINE THE
RELATIONSHIP BETWEEN THE CENTER PROTECTION FACTORS
OF A LARGE SAMPLE OF FACILITIES AS EVALUATED IN
ACCORDANCE WITH THE ENGINEERING MANUAL AND THE
CENTER PROTECTION FACTORS OF THE SAME FACILITIES
AS EVALUATED IN THE NATIONAL FALLOUT SHELTER
SURVEY PRIOR TO FEBRUARY 1967. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-686 303 15.3 5/10 5/11
MICHIGAN STATE UNIV EAST LANSING DEPT OF
COMMUNICATION
CORRELATES OF YOUNG AMERICANS' BELIEFS AND
KNOWLEDGE ABOUT CIVIL DEFENSE, (U)
OCT 68 SIP GREENBERG, BRADLEY S. ;
DOMINICK, JOSEPH R. ;
REPT. NO. 2, BG-5
CONTRACT: DAHC20-67-C-G119

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-670 984.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, *PUBLIC
OPINION), ATTITUDES, ADOLESCENTS, STUDENTS,
SOCIAL COMMUNICATION, FALLOUT SHELTERS, COSTS,
DECISION MAKING, MOTIVATION, QUESTIONNAIRES (U)

THIS STUDY EXAMINED CERTAIN COMMUNICATION BEHAVIORS
AND ATTITUDINAL BEHAVIORS OF TEEN-AGERS AND THEIR
CONCEPTIONS OF CIVIL DEFENSE AND FALLOUT SHELTERS.
THREE ASPECTS OF COMMUNICATION ACTIVITY WERE
EXAMINED--NUMBER OF SOURCES FOR CIVIL DEFENSE
INFORMATION, COMMUNICATED INTEREST IN CIVIL DEFENSE
AND KNOWLEDGE ABOUT CIVIL DEFENSE. TWO OF THE
ABOVE BEHAVIORS--USING MANY SOURCES FOR CD
INFORMATION AND MUCH COMMUNICATED INTEREST IN CD--
WERE HIGHLY INTERCORRELATED. BOTH WERE ALSO
ASSOCIATED WITH MORE MASS MEDIA USE, FREQUENT FAMILY
INTERACTION, AND MORE SCHOOL CD ACTIVITIES. THEY
WERE ALSO ASSOCIATED WITH POSITIVE ATTITUDES TOWARD
CD. KNOWLEDGE ABOUT CD COULD NOT BE WELL
EXPLAINED BY THE VARIABLES IN THE PRESENT STUDY.
WITH REGARD TO THE TEEN-AGERS' ATTITUDES TOWARD
CIVIL DEFENSE AND FALLOUT SHELTERS, THE TWO CRITICAL
ATTITUDINAL AREAS WERE THE INDIVIDUAL'S GENERAL
EVALUATION OF SHELTERS AND THE ATTITUDES HE PERCEIVED
HIS PARENTS TO HAVE. EACH OF THREE SPECIFIC
ASPECTS OF SHELTER ATTITUDES--PROTECTION, CONDITIONS
INSIDE, AND COSTS--WAS STRONGLY INTER-RELATED WITH
BOTH THE TEEN-AGER'S OWN EVALUATION AND HIS
PERCEPTION OF HIS PARENT'S ATTITUDES. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-687 297 1573

PITTSBURGH UNIV PA DEPT OF SOCIOLOGY

CITIES AND CIVIL DEFENSE: AN ECOLOGICAL APPROACH TO
THE ANALYSIS OF CIVIL DEFENSE DATA. (U)

DESCRIPTIVE NOTE: SUMMARY REPT.,

SEP 68 69P MYERS, HOWARD P. ;

CONTRACT: DAHC20-67-C-0122

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON AMERICANS' VIEWS ABOUT
CIVIL DEFENSE ISSUES.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, *PUBLIC
OPINION), STATISTICAL ANALYSIS, URBAN AREAS,
FALLOUT SHELTERS, SURVIVAL,
REACTION(PSYCHOLOGY), ECOLOGY, ATTITUDES,
POPULATION (U)

IN A STUDY IN WHICH ECOLOGICAL AND CIVIL DEFENSE
VARIABLES ARE CROSS-TABULATED, IT IS FOUND THAT
POPULATIONS OF CITIES THAT ARE RELATIVELY UNSTABLE,
MOBILE, AND IMMATURE ARE LIKELY TO DISPLAY A
POTENTIAL FOR CIVIL DEFENSE ACTION, FAVORABLE
EVALUATION OF FALLOUT SHELTERS IN PARTICULAR AND
CIVIL DEFENSE IN GENERAL. PERCEPTION OF LOCAL DANGER
AND CHANCES OF SURVIVAL, AND A MARKED LEANING TOWARD
CIVIL DEFENSE WHEN RELATED ISSUES IN THE BROADER
CONTEXT OF NATIONAL AND INTERNATIONAL AFFAIRS ARE
CONSIDERED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-687 381 15/3 5/11
PITTSBURGH UNIV PA DEPT OF SOCIOLOGY
CIVIL DEFENSE FAVORABILITY. A CRITICAL
ANALYSIS.
DESCRIPTIVE NOTE: SUMMARY REPT.,
JUL 68 46F MYERS, HOWARD P. ;
CONTRACT: DAHC20-67-C-0122, NSF-G11309

(U)

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, *PUBLIC
OPINION), STATISTICAL ANALYSIS, PROTECTION,
NUCLEAR EXPLOSIONS, FALLOUT SHELTERS, SOCIOLOGY,
ATTITUDES

(U)

BY LOCATING PEOPLE IN TERMS OF A DISTINCTION
BETWEEN CIVIL DEFENSE FAVORABILITY AS A SOCIAL
PRESCRIPTION AND CIVIL DEFENSE FAVORABILITY AS A
SOCIAL ISSUE, IT WAS POSSIBLE TO SPECIFY TENDENCIES
IN TERMS OF THE VARIABLES THAT WERE THE FOC OF THIS
ANALYSIS. HIGHLY INFORMED PEOPLE WHO DISAGREED
THAT THE POWERS OF THE FEDERAL GOVERNMENT ARE
EXCESSIVE SHOWED TENDENCIES TO OBSERVE SOCIAL
PRESCRIPTIONS (TOOK PROTECTIVE STEPS IN THE CASE OF
NUCLEAR ATTACK) AND TO SUPPORT SOCIAL ISSUES
(FAVORED THE BUILDING OF FALLOUT SHELTERS).
LOWLY INFORMED PEOPLE WHO AGREED THAT THE POWERS
ARE EXCESSIVE SHOWED JUST THE OPPOSITE TENDENCIES.
PEOPLE WHO WERE HIGHLY INFORMED BUT WHO AGREED AND
PEOPLE WHO WERE LOWLY INFORMED BUT WHO DISAGREED
SHOWED MIXED TENDENCIES. FOR THE LATTER, SUPPORT
FOR SHELTER BUILDING WAS LARGELY A CONVENTIONALIZED
RESPONSE. FOR THE FORMER, OPPOSITION WAS NOT A
REFLECTION OF DEFIANCE TOWARDS A PARTICULAR SOCIAL
INSTITUTION. IT WAS THE ARTICULATION OF A POSITION
IN WHICH A CERTAIN CONTROVERSY WAS PERCEIVED.
(AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-687 704 15/3 13/2 13/13
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
NUCLEAR BLAST RESISTANT WATER WELLS. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT. JUL 65-JUN 68,
MAY 69 SSP NORBUTAS, J. A. I
REPT. NO. NCEL-TR-624
PROJ: Y-7011-05-02-353

UNCLASSIFIED REPORT

DESCRIPTORS: (*NUCLEAR EXPLOSIONS, SHELTERS),
(*WATER WELLS, SHELTERS), (*SHELTERS,
COOLING), DESIGN, HARDENING, CIVIL DEFENSE
SYSTEMS, SURVIVAL, SHOCK WAVES, GELS (U)
IDENTIFIERS: COLLECTIVE PROTECTION,
OVERPRESSURE (U)

A PROPOSED CONCEPT AND ASSOCIATED DESIGN CRITERIA
FOR BLAST-RESISTANT WATER WELLS ARE PRESENTED.
EMPHASIS IS ON THE DESIGN OF DEEP WELLS FOR THE
COOLING OF HARDENED SHELTERS. THE SCOPE OF THE
STUDY IS LIMITED TO BLAST OVERPRESSURES UNDER 300 PSI
AND WEAPON YIELDS LESS THAN 20 MT. A UNIQUE
FEATURE OF THE CONCEPT IS THE USE OF A GEL-LIKE
MATERIAL TO ISOLATE THE WELL CASING FROM BLAST-
INDUCED GROUND MOTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 7BML27

AD-686 099 5/10 1973 13/13
GEORGIA UNIV ATHENS CIVIL DEFENSE RESEARCH
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 68 328P HAMMES, JOHN A. ;
AHEARN, THOMAS R. ; FOUGHNER, JAMES W. ;
BEUSSEE, MAY P. ; BRAUN, MARY E. ;
CONTRACT: DAHC20-68-C-0114
PROJ: AF-1500
TASK: 1520

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO APPENDICES, AD-686
100.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, FALLOUT
SHELTERS), (*FALLOUT SHELTERS, *SOCIAL
PSYCHOLOGY); CIVIL DEFENSE PERSONNEL, TRAINING,
WATER SUPPLIES, MEDICAL EXAMINATION, SANITARY
ENGINEERING, FOOD, FIRE SAFETY, CHILDREN, TEST
METHODS (U)
IDENTIFIERS: *HABITABILITY (U)

THE CIVIL DEFENSE RESEARCH STAFF OF THE
UNIVERSITY OF GEORGIA CONDUCTED TWELVE SIMULATED
COMMUNITY SHELTER OCCUPANCY TESTS DURING THE PERIOD
1962-67. THE PRESENT REPORT IS A SYNTHESIS OF
FINDINGS OF THE LARGE-GROUP STUDIES, RANGING IN
NUMBERS OF PARTICIPANTS FROM 160-1,000 PERSONS, AND
INVOLVING MEN, WOMEN, AND CHILDREN CONFINED FOR
PERIODS VARYING FROM ONE DAY TO ONE WEEK.
IMPLICATIONS FOR THE NATIONAL SHELTER PROGRAM
ARE DISCUSSED, AS WELL AS RECOMMENDATIONS FOR FUTURE
RESEARCH. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-688 100 5/10 15/3 13/13
GEORGIA UNIV ATHENS CIVIL DEFENSE RESEARCH
SHELTER OCCUPANCY STUDIES AT THE UNIVERSITY OF
GEORGIA. APPENDICES. (U)
DESCRIPTIVE NOTE: FINAL REPT.
DEC 68 115P
CONTRACT: DAHC20-68-C-0114
PROJ: AF-1500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: APPENDICES TO AD-688 099.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, FALLOUT
SHELTERS), (*FALLOUT SHELTERS, SOCIAL
PSYCHOLOGY), CIVIL DEFENSE PERSONNEL, TRAINING,
MANAGEMENT ENGINEERING, LOGISTICS, TEST METHODS,
REACTION(PSYCHOLOGY), STATISTICAL DATA (U)
IDENTIFIERS: *HABITABILITY (U)

CONTENTS. SHELTER MANAGEMENT; SHELTER
HANDBOOK FOR UNTRAINED MANAGEMENT; SHELTEREE
REACTIONS; SHELTER SUPPLIES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-68E 186 13/13 15/3
URS SYSTEMS CORP BURLINGAME CALIF
AN EXPLORATORY STUDY TO ASSESS THE MAGNITUDE OF OCD
FOUNDATION PROBLEMS. (U)
DESCRIPTIVE NOTE: FINAL SUMMARY REPT.,
NOV 68 128P MASON, H. WALTER, D. I
REPT. NO. URS-693-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
STANFORD RESEARCH INST., MENLO PARK, CALIF.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, URBAN
AREAS), (*FOUNDATIONS(STRUCTURES),
REVIEWS), (*NUCLEAR EXPLOSIONS,
FOUNDATIONS(STRUCTURES)), SOILS, MOTION,
SHOCK WAVES, EARTHQUAKES, BLAST, PRESSURE,
INTENSITY, RESPONSE, BUILDINGS,
FAILURE(MECHANICS), DESIGN, FALLOUT
SHELTERS (U)
IDENTIFIERS: OVERPRESSURE, SOIL LIQUEFACTION,
GROUND MOTION (U)

THE OBJECTIVE OF THE STUDY WAS TO EXAMINE AVAILABLE
DATA ON SOIL RESPONSE UNDER EXPLOSIVE LOADING
OVERPRESSURES IN THE RANGE OF INTEREST TO THE
OFFICE OF CIVIL DEFENSE AND TO APPLY THIS
INFORMATION TO THE FOUNDATION CONDITIONS AT SOME
AMERICAN CITIES. SEVERAL PROBLEM AREAS WERE
IDENTIFIED WHICH HAVE NOT PREVIOUSLY BEEN CONSIDERED.
THESE INCLUDE MUCH LARGER GROUND MOTIONS THAN
PREVIOUSLY PREDICTED WHEN THE EXPLOSION TAKES PLACE
IN WATER OR SATURATED SOIL AND THE POSSIBILITY OF
FOUNDATION FAILURES DUE TO LIQUEFACTION OF THE
SUPPORTING SUBSOIL. AN EXAMINATION OF THE GENERAL
FOUNDATION CONDITIONS OF SIX AMERICAN CITIES IN
LIGHT OF THESE FINDINGS SHOWED THAT MANY FOUNDATION
PROBLEMS EXIST WHICH MUST BE TAKEN INTO ACCOUNT IN
ANY SHELTER DESIGN OR EVALUATION PROGRAM.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-688 929 18/6 11/4 13/13 15/2

ILLINOIS UNIV URBANA

EXPERIMENTAL DETERMINATION OF THE GAMMA-RAY
SHIELDING CHARACTERISTICS OF A RIBBED SLAB:

(U)

APR 49 72P GREEN, D. W. ; PREISS, K. ;

CHILTON, S. P. ; CHILTON, A. B. ;

REPT. NO. NKS-49

CONTRACT: N00238-46-C-0311

MONITOR: USNRDL TRC-09-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON NUCLEAR RADIATION
SHIELDING STUDIES.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (*GAMMA RAYS, SHIELDING),
(*SHIELDING, CONCRETE), STRUCTURAL PARTS,
EFFECTIVENESS; ATTENUATION; EXPERIMENTAL
DATA

(U)

IDENTIFIERS: CONCRETE SLABS

(U)

EXPERIMENTS WERE CARRIED OUT TO MEASURE THE
SHIELDING EFFECTIVENESS OF CONCRETE SLABS, BOTH
RIBBED AND EQUIVALENT SHEARED CONFIGURATIONS, FOR
BROAD PARALLEL BEAMS OF ESSENTIALLY MONOENERGETIC
RADIATION. THE BROAD-BEAM SOURCE CONFIGURATION WAS
SIMULATED BY MEANS OF A MOVABLE SOURCE OF COBALT-60
RADIATION COLLIMATED TO A THIN BEAM, AND BY USE OF A
LINE DETECTOR. ANGLES OF INCIDENCE OF 0 DEGREES
(NORMAL), 45 DEGREES, AND 60 DEGREES WERE
INVESTIGATED. RESULTS WERE COMPARED WITH PREVIOUS
MONTE CARLO CALCULATIONS AND SHOWN TO BE
CONSISTENT WITH THEM, PROVIDED CERTAIN FACTORS, SUCH
AS THE ANGULAR SPREAD OF THE COLLIMATED BEAM, WERE
TAKEN INTO ACCOUNT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-688 958 13/13 15/3 5/3

STANFORD RESEARCH INST MENLO PARK CALIF
PARAMETRIC STUDY OF SHELTER SYSTEM COSTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

JAN 69 293P LOGOTHETTI, T. J. IGOEN, R.

L. RYAN, J. W. KAMRADT, C. A. WIEHLE, C.

K. I.

CONTRACT: DAHC20-67-C-0116

PROJ: SRI-MU-6250-D10

UNCLASSIFIED REPORT

DESCRIPTORS: (NUCLEAR EXPLOSIONS, BLAST),
(SHELTERS, COSTS), STRUCTURES, DESIGN,
SELECTION, REINFORCED CONCRETE, PROTECTION,
HARDNESS, CONSTRUCTION MATERIALS, UNDERGROUND
STRUCTURES, PERFORMANCE (ENGINEERING),
SPECIFICATIONS, CONFIGURATION, VENTILATION,
CONTROLLED ATMOSPHERES, STRUCTURAL PARTS, CIVIL
DEFENSE SYSTEMS

(U)

IDENTIFIERS: OVERPRESSURE

(U)

CURRENT RESEARCH DATA ON BLAST SHELTERS ARE
REVIEWED IN THE FIVE AREAS OF STRUCTURE, EARTHWORK,
ENTRANCEWAYS, ENVIRONMENTAL CONTROL SYSTEMS, AND
SUPPLIES. THE RESULTS OF THESE REVIEWS, PRESENTING
COST AND PERFORMANCE DATA IN GRAPHS AND TABLES, ARE
INCORPORATED INTO COST FUNCTIONS DEVELOPED TO
EVALUATE PRELIMINARY DESIGN CONCEPTS FOR A VARIETY OF
BLAST SHELTER SIZES, SHAPES, SPACE UTILIZATION
CONCEPTS, AND HARDNESS RATINGS. PREFERRED SHELTER
CONFIGURATIONS ARE SELECTED USING CRITERIA OF COSTS
PER UNIT FLOOR AREA AND PER OCCUPANT. QUESTIONABLE
COST ASSUMPTIONS AND PERFORMANCE SPECIFICATIONS ARE
IDENTIFIED AS AREAS FOR FURTHER RESEARCH.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-690 209 6/8 15/3
STANFORD RESEARCH INST MENLO PARK CALIF
STORAGE STABILITY OF CIVIL DEFENSE SHELTER
RATIONS. (U)
DESCRIPTIVE NOTE: ANNUAL REPT. NO. 7, 1 JUL 68-30 JUN
69,
JUN 69 77P CECIL, SAM R. ;
CONTRACT: DAHC20-67-C-0136

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH GEORGIA
EXPERIMENT STATION, REPT. NO. 153-VII-GES, PROJ.
NO. UGA-ST-1-53. SEE ALSO ANNUAL REPT. NO. 6, AD-
673 817.

DESCRIPTORS: (*FALLOUT SHELTERS, SURVIVAL
KITS), (*FOOD, STORAGE),
AGING(MATERIALS), CEREALS, CARBOHYDRATES,
TIME, MOISTURE, TEMPERATURE CONTROL,
CONTAINERS, STABILITY, CIVIL DEFENSE SYSTEMS,
LEAKAGE(FLUID), CORROSION, DEGRADATION,
RUPTURE, COLORS, PH, ODORS, (U)
IDENTIFIERS: *SHELTER RATIONS, FLAVORS (U)

RESULTS ARE REPORTED ON THE STABILITY OF 6 LOTS OF
FALLOUT SHELTER CEREAL RATIONS AND 3 LOTS OF
CARBOHYDRATE SUPPLEMENT STORED 4 AND 5 YEARS,
RESPECTIVELY, AT SPECIFIED TEMPERATURES AND RELATIVE
HUMIDITIES. CEREAL RATIONS INCLUDE 2 LOTS EACH OF
SURVIVAL CRACKERS, BISCUITS, AND BULGUR WHEAT WAFERS.
DATA INCLUDE (1) BURSTING STRENGTH, MOISTURE
CONTENT, AND GENERAL CONDITION OF V3C FIBERBOARD
CASES; (2) RESIDUAL OXYGEN, LEAKING AND CONDITION
OF SEAMS, CORROSION, AND COATING DEFECTS OF 2 1/2-
GALLON AND 5-GALLON METAL CANS; (3) BREAKAGE OF
PACKAGE SEALS, SEAMS OR MATERIALS, AND OF PRODUCT
UNITS; (4) FRACTURE STRENGTH AND RANCIDITY VALUES
OF CEREAL ITEMS, (5) PH AND SUGAR CONTENTS OF
SUPPLEMENT ITEMS, AND (6) MOISTURE CONTENT,
COLOR, SENSORY QUALITY, AND HEDONIC RATINGS OF ALL
ITEMS. (AUHTOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-690 251 15/3

RESEARCH TRIANGLE INST DURHAM N C
A RESOURCE ALLOCATION MODEL FOR SHELTER SYSTEMS
ANALYSIS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,

MAY 69 26P WRIGHT, JAMES C. ;

REPT. NO. RTI-R-OU-230-1

CONTRACT: OCD-PS-64-56

PROJ: RTI-OU-230-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, *COST
EFFECTIVENESS), CIVIL DEFENSE SYSTEMS,
PROGRAMMING(COMPUTERS), MATHEMATICAL
PREDICTION, MODELS(SIMULATIONS), STATISTICAL
ANALYSIS, ENVIRONMENT, BLAST, NUCLEAR RADIATION,
PROBABILITY, VULNERABILITY, MICHIGAN (U)

IDENTIFIERS: ATTACK ENVIRONMENTS,
DETROIT(MICHIGAN) (U)

ONE OF THE PRIMARY OBJECTIVES OF SHELTER RESEARCH
IN CIVIL DEFENSE IS TO ASSESS THE COST-EFFECTIVENESS
AND FEASIBILITY OF ALTERNATIVE SHELTER SYSTEMS. IN
ORDER TO BETTER DIRECT THE SUBORDINATE RESEARCH TASKS
AND THUS IMPROVE THE INPUTS TO THE TOTAL CD SYSTEMS
ANALYSIS, THE BUDGET ALLOCATION MODEL (BAM). A
PROCEDURE FOR STUDYING RESOURCE ALLOCATION AND FOR
EVALUATING THE COST-EFFECTIVENESS OF ALTERNATIVE
SHELTER SYSTEMS WAS DEVELOPED. BAM DETERMINES AN
OPTIMUM MIX OF ADDITIONAL SHELTERS WITHIN A VARIETY
OF CONSTRAINTS WHICH INCLUDE THE BUDGET, ATTACK
ENVIRONMENT, SHELTER VULNERABILITY AND COST, AND
POPULATION DISTRIBUTION TO IMPROVE AN EXISTING
SHELTER POSTURE. THE REPORT DESCRIBES THE
OPERATION OF BAM AND EMPHASIZES THE IMPROVEMENTS
ADDED TO THE MODEL TO EXPAND THE TYPES OF RESOURCE
ALLOCATION STUDIES THAT MAY BE PERFORMED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-691 454 6/18 13/13
RADIATION RESEARCH ASSOCIATES INC FORT WORTH TEX
MONTE CARLO STUDY OF INTERIOR PARTITION EFFECTS ON
FALLOUT SHIELDING. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
JAN 69 66P PRICE: J. H. FRENCH, R.
L. ;
REPT. NO. RRA-T91
CONTRACT: N00228-68-C-1770
PROJ: OCD-111211
MONITOR: USNRDL TRC-69-5

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADIOACTIVE FALLOUT, SHELTERS),
(*SHELTERS, PROTECTION), NUCLEAR RADIATION,
MONTE CARLO METHOD, CONCRETE, THICKNESS,
CORRELATION TECHNIQUES, ENGINEERING, CIVIL
DEFENSE SYSTEMS, NUCLEAR EXPLOSIONS, GAMMA
RAYS (U)
IDENTIFIERS: *RADIATION SHIELDING, *PROTECTION
FACTORS, COLLECTIVE PROTECTION, *FALLOUT
SHIELDING (U)

PROTECTION FACTORS WERE CALCULATED BY MONTE
CARLO FOR CYLINDRICAL BARRIERS WITH A CONCENTRIC
INTERIOR PARTITION. THE BARRIER THICKNESSES WERE
20, 40, AND 80 PSF AND THE PARTITION THICKNESSES WERE
20 AND 40 PSF. THE RADIUS OF THE BARRIER WAS 10.0
FT AND THE INTERIOR PARTITION HAD RADIUS OF 7.5, 5.0,
AND 10.0 FT. THE CYLINDRICAL CONCRETE BARRIERS
WERE INFINITE IN HEIGHT. THE ENGINEERING
METHOD WAS ALSO USED TO CALCULATE PROTECTION
FACTORS FOR THE CYLINDRICAL BARRIERS, AND THE RESULTS
WERE COMPARED WITH THE MONTE CARLO DATA.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-692 312 13/13 15/6 18/8
STANFORD RESEARCH INST MENLO PARK CALIF
FEASIBILITY STUDY OF SLANTING FOR COMBINED NUCLEAR WEAPONS EFFECTS. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 69 313P MURPHY, H. L. ;
CONTRACT: DAHC20-67-C-0136
PROJ: SRI-MU-6300-500

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (*SHELTERS, DESIGN), EXPLOSION
EFFECTS, OPTIMIZATION, COSTS, COST
EFFECTIVENESS, CONSTRUCTION MATERIALS, RADIOACTIVE
FALLOUT, FALLOUT SHELTERS, BEAMS(STRUCTURAL),
WALLS, DOORS, FOUNDATIONS(STRUCTURES),
FIRE SAFETY, BLAST, COOLING + VENTILATING
EQUIPMENT, TOLERANCES(PHYSIOLOGY),
CONSTRUCTION, FEASIBILITY STUDIES (U)
IDENTIFIERS: *COMBINED NUCLEAR EFFECTS SLANTING,
*FALLOUT SLANTING, *NUCLEAR WEAPONS EFFECTS (U)

THE REPORT IS IN A FORMAT SUITABLE FOR A PROTOTYPE
GUIDE FOR ARCHITECTS AND ENGINEERS USE IN SLANTING
NEW BUILDING DESIGNS TOWARD BASEMENT CONSTRUCTION OF
SHELTERS AGAINST 15 PSI (FREE FIELD) NUCLEAR
BLAST OVERPRESSURE AND ASSOCIATED WEAPONS EFFECTS.
THIS REPORT, HOWEVER, COVERS ONLY THE FIRST STAGE
OF THE GUIDE'S PREPARATION, INCLUDING THREE CASE
STUDIES. ALL WERE FOR CLOSED RATHER THAN OPEN
SHELTER, THE OBJECTIVE BEING TO PROVIDE THE
PRESCRIBED PROTECTION LEVEL AT AN ADDITIONAL
CONSTRUCTION COST OF NO MORE THAN \$6/SF OF SHELTER
SPACE. THE COST LIMITATION WAS APPROXIMATELY MET
IN THE THIRD CASE STUDY, USING A FULL BASEMENT, BUT
COULD NOT BE MET IN THE FIRST TWO CASE STUDIES, USING
PARTIAL BASEMENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-692 505 13/13 15/3 18/6
FLOW CORP WATERTOWN MASS NUCLEAR DIV
INTERIOR PARTITION AND BASEMENT SHELTER
EXPERIMENTS.
DESCRIPTIVE NOTE: FINAL REPT.,
APR 69 74P STARBIRD.A. W. ;
REPT. NO. CONESCO-4903
CONTRACT: N00228-67-C-2958
MONITOR: USNRDL TRC-69-24

(U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: DETACHABLE SUMMARY SHEET INSERTED.

DESCRIPTORS: (*NUCLEAR EXPLOSIONS, RADIOACTIVE
FALLOUT), (*SHELTERS, *SHIELDING), CONCRETE,
THICKNESS, MODEL TESTS, RADIOACTIVE ISOTOPES,
RADIATION MONITORS, SAFETY, CIVIL DEFENSE
SYSTEMS

(U)

IDENTIFIERS: FALLOUT SHIELDING, RADIATION
SHIELDING

(U)

A SERIES OF INTERIOR PARTITION AND BASEMENT SHELTER
EXPERIMENTS HAVE BEEN PERFORMED, EMPHASIZING BELOW
GROUND DETECTOR POSITIONS. MEASUREMENTS WERE MADE
ON ELEVEN STRUCTURE COMBINATIONS USING CO-60
SOURCES AT GROUND LEVEL TO SIMULATE 'FALLOUT'
CONTAMINATION. TEST STRUCTURES CONSISTED OF 6-FOOT
ID EXTERIOR AND 3-FOOT ID INTERIOR CONCRETE
WALLS, IN CONJUNCTION WITH CORRESPONDING 6 AND 3 FOOT
DIAMETER HORIZONTAL MEMBERS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-692 816 13/13 18/3
AMERICAN INST FOR RESEARCH SAN MATEO CALIF
OPERATIONAL CAPABILITIES OF COMMUNITY FALLOUT
SHELTER SYSTEMS. A WORKBOOK FOR USE BY LOCAL CIVIL
DEFENSE OFFICIALS. (U)
APR 63 426P WILLIS, MARY B. ;
REPT. NO. AIR-C98-4/63-RP WORKBOOK
CONTRACT: OCD-05-62-170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-692 817, AD-692 818,
AND AD-692 819.

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS, *FALLOUT
SHELTERS), DESIGN, MAINTENANCE, WARNING
SYSTEMS, RADIOACTIVE FALLOUT, MONITORS,
CONTROLLED ATMOSPHERES, FOOD, SANITARY
ENGINEERING, MEDICAL SUPPLIES, COMMUNICATION
SYSTEMS, TRAINING, CONTROL SYSTEMS, FIRE SAFETY,
INSTRUCTION MANUALS (U)
IDENTIFIERS: COLLECTIVE PROTECTION, RADIATION
SHIELDING, COMMUNITY FALLOUT SHELTER SYSTEMS,
EVALUATION (U)

THE DOCUMENT IS A WORKING DRAFT REPRESENTING A
PROPOSED APPROACH AND PROVIDING GUIDANCE IN THE
DEVELOPMENT OF COMMUNITY SHELTER SYSTEMS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-692 817 13/13 18/3
AMERICAN INST FOR RESEARCH SAN MATEO CALIF
OPERATIONAL CAPABILITIES OF COMMUNITY FALLOUT
SHELTER SYSTEMS. INSTRUCTION MANUAL FOR EVALUATION
INSTRUMENT, (U)
APR 63 13P SHONTZ, WILLIAM D. ;
REPT. NO. AIR-C98-4/63-RP INSTRUCTION
CONTRACT: OCD-OS-62-170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-692 816, AD-692 818,
AND AD-692 819.

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS, FALLOUT
SHELTERS), DESIGN, MAINTENANCE, WARNING
SYSTEMS, RADIOACTIVE FALLOUT, MONITORS,
CONTROLLED ATMOSPHERES, FOOD, SANITARY
ENGINEERING, MEDICAL SUPPLIES, COMMUNICATION
SYSTEMS, TRAINING, CONTROL SYSTEMS, FIRE SAFETY,
INSTRUCTION MANUALS (U)
IDENTIFIERS: COLLECTIVE PROTECTION, RADIATION
SHIELDING, COMMUNITY FALLOUT SHELTER SYSTEMS,
EVALUATION (U)

THE REPORT CONTAINS 487 PLAN FACTORS WHICH HAVE
BEEN IDENTIFIED AS BEING OF VARYING DEGREES OF
IMPORTANCE TO THE OPERATIONAL CAPABILITY OF A
COMMUNITY FALLOUT SHELTER SYSTEM. THESE FACTORS
ARE ORGANIZED INTO 33 SUBJECT-MATTER CATEGORIES.
THE CATEGORIES ARE: PLAN/COMMUNITY
COMPATIBILITY, POPULATION INDOCTRINATION AND
TRAINING, SHELTER ASSIGNMENTS, SHELTER MANAGEMENT
(PRE-EMERGENCY), SHELTER STOCKING, SHELTER
DESIGN, SHELTER UTILIZATION PLAN, PERIODIC
MAINTENANCE, POST-SHELTER PLANNING (PRE-
EMERGENCY), WARNING SYSTEM, INGRESS,
RADIOLOGICAL DEFENSE, SHELTER MANAGEMENT (IN-
SHELTER), ATMOSPHERE CONTROL, WATER, FOOD,
SLEEP, SANITATION, MEDICAL, SPACE-VOLUME
REQUIREMENTS, LIGHTING, POWER SUPPLY,
CONTINGENCY PLANNING, COMMUNICATION, AND
CONTROL. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-692 818 13/13 18/3
AMERICAN INST FOR RESEARCH SAN MATEO CALIF
OPERATIONAL CAPABILITIES OF COMMUNITY FALLOUT
SHELTER SYSTEMS. EVALUATION INSTRUMENT, (U)
APR 63 64P SHONTZ, WILLIAM D. ;
WILLIS, MARY B. ; ANGELL, DAVID ;
REPT. NO. AIR-C98-4/63-RP-EVALUATION
CONTRACT: OCD-OS-62-170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-692 816, AD-692 817,
AND AD-692 819.

DESCRIPTORS: (•NUCLEAR EXPLOSIONS, FALLOUT
SHELTERS), (•CIVIL DEFENSE SYSTEMS, •FALLOUT
SHELTERS), REVIEWS, DESIGN, MAINTENANCE,
WARNING SYSTEMS, RADIOACTIVE FALLOUT, MONITORS,
CONTROLLED ATMOSPHERES, FOOD, SANITARY
ENGINEERING, MEDICAL SUPPLIES, COMMUNICATION
SYSTEMS, TRAINING, CONTROL SYSTEMS, FIRE SAFETY,
QUESTIONNAIRES, INSTRUCTION MANUALS (U)
IDENTIFIERS: COLLECTIVE PROTECTION, RADIATION
SHIELDING, COMMUNITY FALLOUT SHELTER SYSTEMS,
EVALUATION (U)

THE REPORT PRESENTS MATERIAL IN THE CIVIL DEFENSE
LITERATURE REGARDING OPERATIONAL CAPABILITIES OF
COMMUNITY FALLOUT SHELTER SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-692 819 13/13 18/3
AMERICAN INST FOR RESEARCH SAN MATEO CALIF
OPERATIONAL CAPABILITIES OF COMMUNITY FALLOUT
SHELTER SYSTEMS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
APR 63 65P SHONTZ, WILLIAM D. ;
REPT. NO. AIR-C98-4/63-FR
CONTRACT: OCD-05-62-170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-692 816, AD-692 817,
AND AD-692 818.

DESCRIPTORS: (CIVIL DEFENSE SYSTEMS, FALLOUT
SHELTERS); OPERATION, MAINTENANCE, STRUCTURAL
PROPERTIES, REVIEWS, INSTRUCTION MANUALS (U)
IDENTIFIERS: COLLECTIVE PROTECTION, RADIATION
SHIELDING, COMMUNITY FALLOUT SHELTER SYSTEMS,
EVALUATION (U)

THE PRIMARY PURPOSE OF THE STUDY WAS TO DEVELOP AN
EVALUATION INSTRUMENT WHICH COULD BE USED TO ASSESS
THE OPERATIONAL CAPABILITIES OF COMMUNITY FALLOUT
SHELTER SYSTEMS. A SECONDARY PURPOSE WAS TO
TRANSLATE THE BASIC DATA USED IN CONSTRUCTING THE
EVALUATION INTO GUIDANCE MATERIAL USEFUL TO LOCAL
CIVIL DEFENSE PLANNERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-696 135 15/3

URS RESEARCH CO BURLINGAME CALIF
CIVIL DEFENSE OPERATIONAL CONCEPTS,
MAY 69 120P MILLER, CARL F. I

(U)

REPT. NO. URS-757-1
CONTRACT: DAMC20-49-C-0142
PROJ: OCD-3119A

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
*MANAGEMENT PLANNING), (*NUCLEAR WARFARE,
PASSIVE DEFENSE), NUCLEAR EXPLOSIONS, SYSTEMS
ENGINEERING, HAZARDS, SHELTERS, RADIOACTIVE
FALLOUT, DAMAGE ASSESSMENT, SURVIVAL, RADIATION
EFFECTS, MORTALITY RATES, CASUALTIES, DEBRIS,
FIRES, BLAST, VEHICLES
IDENTIFIERS: *OPERATIONAL CONCEPTS

(U)
(U)

RELATIONSHIPS AMONG NUCLEAR WEAPONS EFFECTS AND
CIVIL DEFENSE OPERATIONAL SYSTEM VARIABLES ARE
SUMMARIZED AND USED AS A BASIS FOR DERIVING CIVIL
DEFENSE OPERATIONAL CONCEPTS. CLASSIFICATION OF
HAZARD CONDITIONS, AND SYSTEMS OF STANDARD OPERATION
ROUTINES, CENTERED ON PROTECTIVE SHELTER AND ON
OPERATIONS FROM THE SHELTER, NINE GENERAL CLASSES OF
BASIC HAZARD CONDITIONS (BHC) FOR WHICH DIFFERENT
OPTIONS OF STANDARD OPERATING ROUTINES (SORAS)
WOULD BE REQUIRED ARE SUGGESTED. THE NINE CLASSES
ARE COMBINATIONS OF THREE POSSIBLE LEVELS OF FALLOUT
HAZARDS AND THREE POSSIBLE LEVELS OF PHYSICAL DAMAGE
FOR AN AREA. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-696 461 13/1 13/13 15/3
STANFORD RESEARCH INST MENLO PARK CALIF
SHELTER CONFIGURATION; ENVIRONMENTAL CONTROL
SYSTEMS AND RELATED PARAMETERS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
MAR 69 115P ALLEN, FRANK C. ;
CONTRACT: DAHC20-68-C-0155
PROJ: OCD-1236A; SRI-MU-7327
TASK: 1230

UNCLASSIFIED REPORT

DESCRIPTORS: (*NUCLEAR EXPLOSIONS, SHELTERS),
(*SHELTERS, *CONTROLLED ATMOSPHERES), COST
EFFECTIVENESS, CONFIGURATION, VENTILATION,
UNDERGROUND STRUCTURES, COOLING, PIPES, HEAT
TRANSFER, CARBON DIOXIDE, MOISTURE, AIR, CIVIL
DEFENSE SYSTEMS (U)
IDENTIFIERS: OVERPRESSURE (U)

THE INVESTIGATION IS PRELIMINARY TO STUDIES
CONCERNED WITH (1) SEPARATE AND COMBINED EFFECTS
OF ALL FACTORS THAT SIGNIFICANTLY AFFECT COSTS AND
PERFORMANCE OF ENVIRONMENTAL CONTROL SYSTEMS FOR
SHELTERS AND (2) RECIPROCAL EFFECTS OF STRUCTURE
AND SYSTEM CONFIGURATION ON OVERALL COST-
EFFECTIVENESS. REPRESENTATIVE CONFIGURATIONS ARE
OUTLINED FOR SHELTERS TO BE USED AS MODELS IN
SUBSEQUENT STUDIES, WHICH ARE ORIENTED TOWARD
UNDERGROUND SHELTERS THAT WOULD PROVIDE PROTECTION
FROM WEAPONS EFFECTS IN THE 10-20 PSI OVERPRESSURE
RANGE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-698 486 10/2 15/6
URS RESEARCH CO BURLINGAME CALIF
AVAILABILITY AND USE OF EMERGENCY POWER SOURCES IN
THE EARLY POSTATTACK PERIOD. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
AUG 69 128P FOGET, CARL R. IVAN
HORN, WILLIAM H. I
REPT. NO. URS-710-4
CONTRACT: DAHC20-69-C-0111
PROJ: OCD-3311B

UNCLASSIFIED REPORT

DESCRIPTORS: (*NUCLEAR WARFARE, POWER
SUPPLIES), (*POWER SUPPLIES, SURVIVAL),
(*FALLOUT SHELTERS, POWER SUPPLIES), AUXILIARY
POWER PLANTS, GENERATORS, POWER
PLANTS (ESTABLISHMENTS), STATISTICAL ANALYSIS,
URBAN AREAS, CIVIL DEFENSE SYSTEMS, COST
EFFECTIVENESS, ENGINES + MOTORS, SCHEDULING (U)
IDENTIFIERS: *POST ATTACK RECOVERY, *EMERGENCY
POWER SOURCES, ELECTRIC POWER DEMAND (U)

THE STUDY FOR THE OFFICE OF CIVIL DEFENSE
CONCERNS THE IDENTIFICATION AND USE OF EMERGENCY
POWER SOURCES BOTH CONVENTIONAL AND UNCONVENTIONAL IN
THE EARLY POSTATTACK PERIOD. THE DEMAND FOR
EMERGENCY POWER DURING THE EARLY POSTATTACK PERIOD
WAS CHARACTERIZED AS WAS VARIOUS CANDIDATE EMERGENCY
POWER SOURCES, A COMPARISON OF THE TWO WERE MADE AND
THE FEASIBLE EMERGENCY POWER SOURCES WERE SELECTED
FOR FURTHER STUDY. AN INVENTORY OF THE EMERGENCY
POWER SOURCES IN THE COUNTRY WAS PERFORMED AND
METHODS OF UTILIZING THE POWER SOURCES WERE
DELINEATED. A STATISTICAL STUDY OF THE DEMAND AND
RESPONSE CAPABILITY FOR EMERGENCY POWER WAS MADE
USING SYNTHESIZED 'TYPICAL' CITIES. CASE STUDIES
OF TWO REAL CITIES WERE PERFORMED TO DETERMINE ACTUAL
DEMAND AND RESPONSE CAPABILITIES FOR EMERGENCY POWER
AND THEN COMPARED WITH THE RESULTS OF THE TYPICAL
CITY ANALYSIS. THE COST AND BENEFITS OF EMERGENCY
POWER AS RELATED TO CIVIL DEFENSE EFFORT WERE
DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-812 154 13/13 6/21
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
SHIELDING CONSIDERATIONS IN THE DESIGN OF HARDENED
STRUCTURES. (U)
DESCRIPTIVE NOTE: FINAL REPT. FEB 66-FEB 67;
MAR 67 17P HUDDLESTON, CHARLES H. ;
DOTY, DUANE R. ;
REPT. NO. NCEL-TN-882
PROJ: Y-F011-05-02-358

UNCLASSIFIED REPORT

DESCRIPTORS: (*FALLOUT SHELTERS, SHIELDING);
NUCLEAR WEAPONS, BLAST, COUNTERMEASURES,
DESIGN, CONCRETE, PENETRATION, FAST NEUTRONS,
RADIOACTIVE FALLOUT, LETHAL DOSAGE, MATHEMATICAL
ANALYSIS, CIVIL DEFENSE SYSTEMS (U)

AN EVALUATION HAS BEEN MADE OF SOME OF THE FACTORS
TO BE CONSIDERED IN THE DESIGN OF HARDENED
STRUCTURES. IN PARTICULAR, RADIATION SHIELDING
REQUIREMENTS HAVE BEEN SPECIFIED FOR VARIOUS WEAPON
SIZES, DISTANCES FROM IMPACT POINT, AND BLAST
OVERPRESSURE. IT HAS BEEN SHOWN THAT AN ENVELOPE
OF CURVES CAN BE CONSTRUCTED TO ALLOW THE
SPECIFICATION OF SHIELDING CRITERIA TO INSURE THAT
RADIATION PROTECTION IS COMMENSURATE WITH THE
SURVIVABILITY OF A STRUCTURE FROM BLAST EFFECTS.
ALSO, A MATHEMATICAL ANALYSIS IS GIVEN OF THE
RELATIONSHIP BETWEEN PROTECTION FACTORS AND PERCENT
LETHALITIES DUE TO FALLOUT RADIATION. THE RESULTS
DESCRIBED IN THIS NOTE SHOULD BE DIRECTLY APPLICABLE
TO THE PROMULGATION OF DESIGN CRITERIA FOR RADIATION
SHIELDING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /BML27

AD-843 583 18/8 13/13 15/3 18/3
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
NUCLEAR RADIATION SHIELDING IN THE DESIGN OF
HARDENED STRUCTURES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

OCT 68 24P HUDDLESTON, C. M. IDOTY, D.

R. ; INGOLD, W. C. ;

REPT. NO. NCEL-TR-599

PROJ: Y-F011-05-02-358

UNCLASSIFIED REPORT

DESCRIPTORS: (*CIVIL DEFENSE SYSTEMS,
SHELTERS), (*SHELTERS, NUCLEAR RADIATION),
(*NUCLEAR RADIATION, SHIELDING), HANDBOOKS,
RADIATION EFFECTS, MATHEMATICAL MODELS, NUCLEAR
WARFARE, HARDENING, ATTENUATION, DESIGN,
STATISTICAL ANALYSIS, THERMAL RADIATION, BLAST,
DOSAGE, DUCTS, DOORS, RADIOACTIVE FALLOUT,
SURVIVAL (U)

IDENTIFIERS: YIELD(NUCLEAR EXPLOSIONS),
OVERPRESSURE (U)

THE TRANSMITTED DOSE OF INITIAL RADIATION IS
RELATED TO PEAK OVERPRESSURE, WEAPON YIELD, AND
SHIELD THICKNESS. IT IS SHOWN THAT THE MINIMUM
EXPECTED WEAPON SIZE DETERMINES THE THICKNESS OF THE
RADIATION SHIELD FOR SPECIFIC OVERPRESSURE. A
SIMPLIFIED METHOD IS PRESENTED FOR DETERMINING THE
PROTECTION FACTOR FOR TWO-LEGGED DUCTS. THE
DESIGNER CAN USE EITHER GRAPHICAL METHODS OR A
NOMOGRAM. A MATHEMATICAL ANALYSIS IS INCLUDED THAT
RELATES PROTECTION FACTORS TO PERCENT LETHALITIES DUE
TO FALLOUT RADIATION. (AUTHOR) (U)

CORPORATE AUTHOR - MONITORING AGENCY

•AMERICAN HYDROGRAPHIC CO NEW YORK

• • •
 C93 9 63TR
 PLANNING GUIDES FOR DUAL-
 PURPOSE SHELTERS,
 AD-412 342

•AMERICAN INST FOR RESEARCH PITTSBURGH PA

• • •
 PLANNING AND ORGANIZING SHELTER
 NON-OPERATIONAL ACTIVITY PROGRAMS,
 AD-410 891

• • •
 OCCUPANCY EXERCISE RESEARCH
 GUIDE: AN INTRODUCTION TO THE
 RESEARCH USE OF THE SHELTER
 EXERCISE FOR TRAINING,
 AD-609 480

• • •
 AIR C99 9 63TR
 GUIDE TO SHELTER ORGANIZATION
 AND MANAGEMENT,
 AD-420 442

•AMERICAN INST FOR RESEARCH SAN MATEO CALIF

• • •
 AIR-C98-4/63-FR
 OPERATIONAL CAPABILITIES OF
 COMMUNITY FALLOUT SHELTER SYSTEMS,
 AD-692 819

• • •
 AIR-C98-4/63-RP-EVALUATION
 OPERATIONAL CAPABILITIES OF
 COMMUNITY FALLOUT SHELTER SYSTEMS.
 EVALUATION INSTRUMENT,
 AD-692 618

• • •
 AIR-C98-4/63-RP INSTRUCTION
 OPERATIONAL CAPABILITIES OF
 COMMUNITY FALLOUT SHELTER SYSTEMS.
 INSTRUCTION MANUAL FOR EVALUATION
 INSTRUMENT,
 AD-692 817

• • •
 AIR-C98-4/63-RP BOOKBOOK
 OPERATIONAL CAPABILITIES OF
 COMMUNITY FALLOUT SHELTER SYSTEMS.
 A BOOKBOOK FOR USE BY LOCAL CIVIL
 DEFENSE OFFICIALS,
 AD-692 816

•AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA

• • •
 AIR-613-1/69-FR
 RESEARCH PROGRAM FOR LARGE
 SHELTER MANAGEMENT.

AD-683 487

• • •
 AIR-705-12/68-FR
 THE EFFECTS OF EXPECTATIONS ON
 SHELTEREE BEHAVIOR,
 AD-683 486

• • •
 AIR-D93E-4/68-FR
 SHELTER MANAGEMENT ACTIVITIES
 IN THE INCREASED READINESS PERIOD.
 (OCD-1543A)
 AD-671 641

• • •
 AIR-F26-8/68-FR
 EXPANSION OF RESEARCH DATA FROM
 SHELTER OCCUPANCY EXERCISES,
 AD-676 852

•AMERICAN INSTITUTES FOR RESEARCH PITTSBURGH PA INST FOR PERFORMANCE TECHNOLOGY

• • •
 AN EXPERIMENTAL STUDY OF
 •INTEGRATED GUIDANCE FOR SHELTER
 MANAGEMENT*,
 AD-644 505

• • •
 AIR-D93A(1/2)-9/66-FR
 AN EXPERIMENTAL ANALYSIS OF
 SELECTED PROBLEMS OF LARGE-SHELTER
 MANAGEMENT, ENVIRONMENTAL THREAT,
 AND SMALL-SHELTER HABITABILITY
 UNDER CONDITIONS OF STRESS,
 AD-645 343

• • •
 AIR-D93A-1/66-FR
 LABORATORY INVESTIGATIONS OF
 SHELTER MANAGEMENT FACTORS,
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*N228(62979)68680
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