1. Keywords

FPS 20
FPS 24
FPS 26
FPS 6
RADAR
SPECIAL

2. Start Date: FY 62 Quarter 2
End Date: FY 62 Quarter 2

3. HQ Division: 42 - LASER MICROWAVE DIVISION

4. Phase:

5. Program NO:

6. Survey Type:

7. INSTALLATION OR SOURCE OF INFORMATION (CITY & STATE OR COUNTY ARE ESSENTIAL)
AD - US ARMY AIR DEF CMD FORMERLY

8. Authors:

9. ARLOC/Activity: 42623 000 - OAKDALE
Location: OAKDALE
State: PA

10. Project Control Number: 4048R0426262

11. Document Type: 1

HEADQUARTERS
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
UNITED STATES ARMY MEDICAL SERVICE

CLASS II ACTIVITY
OF
THE SURGEON GENERAL

ARMY CHEMICAL CENTER
MARYLAND

IN REPLY REFER TO:
USAEHA-MR

18 APR 1962

SUBJECT: Report of Radiological Hygiene Survey No. 4046R42-62

TO: The Surgeon General, ATTN: MEDPS-PO, Department of the Army, Washington 25, D. C.
Commanding General, US Army Air Defense Command, ATTN: Surgeon, Ent Air Force Base, Colorado Springs, Colorado
Commanding General, First Region, US Army Air Defense Command, ATTN: Surgeon, Fort Totten, Flushing 59, New York
Commanding Officer, Pittsburgh Section, 31st Brigade, Oakdale, Pennsylvania
IN TURN

Transmitted herewith is Report of Radiological Hygiene Survey conducted at Pittsburgh Section, 31st Brigade, Oakdale, Pennsylvania, during the period 26 February - 1 March 1962, by 2d Lieutenant Richard G. Berkley, MSC, Health Physicist, and Mr. William A. Palmisano, Electronics Engineer, of this Agency. This report includes findings of the survey, observations based on these findings, and recommendations of this Agency with respect to certain of these findings.

1 Incl
as

Charles W Kraul
CHARLES W. KRAUL
Lt Colonel, MC
Commanding

DECLASSIFIED

FILE

HEADQUARTERS
U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY
UNITED STATES ARMY MEDICAL SERVICE

CLASS II ACTIVITY
OF
THE SURGEON GENERAL

ARMY CHEMICAL CENTER
MARYLAND

USAEHA-MR

18 APR 1962

REPORT OF RADIOLOGICAL HYGIENE SURVEY NO. 4048R42-62
MISSILE MASTER
PITTSBURGH SECTION
31ST BRIGADE
OAKDALE, PENNSYLVANIA
26 FEBRUARY - 1 MARCH 1962

1. AUTHORITY.

a. AR 40-557, par 13.

b. Letter MEDEI-R, U.S. Army Environmental Hygiene Agency, subject: "Radiological Hygiene Surveys of Nike Missile Operations", dated 25 February 1961, through The Surgeon General, to Commanding General, U.S. Army Air Defense Command, Ent Air Force Base, Colorado Springs, Colorado, and indorsements thereto.

2. PURPOSE. The purpose of this survey was to accomplish the following objectives:

a. To evaluate the radiation exposure to persons operating, and to those remaining in the vicinity of, the microwave radiation facilities at Missile Master, Pittsburgh Section, Headquarters, 31st Brigade, Oakdale, Pennsylvania.

b. To make such recommendations as are necessary to protect personnel from needless exposure to microwave radiation.

3. STANDARDS. The publication which has been used as a guide in determining the adequacy of the microwave radiation protection facilities and program is as follows: AR 40-583, "Control of Potential Hazards to Health from Microwave Energy", dated 12 July 1961.

4. INSTRUMENTATION. The following microwave radiation detection instruments were used:

a. Ramcor Model 1200 Densiometer.

b. Empire Power Density Meter, Model NF-157.

5. FINDINGS.

a. The Missile Master complex consisted of two AN/FPS-6 (Air Force), two AN/FPS-6 (Army), and one AN/FPS-20 (Army) radar sets.

b. Power density levels were measured at all locations normally occupied by Army personnel.* (The location of the AN/FPS-20 excluded it as a potential hazard and no measurements were made.) Locations of possible occupied areas where measurements were made are shown in Appendix I, Plate R-552.

c. Power density levels measured at these locations are listed in Appendix II.

d. Operating parameters of sets surveyed are listed in Appendix III.

e. Other Areas. Measurements made at ground level in the surrounding area showed no measurable microwave radiation. This was as expected because of the height of the towers, 25 feet to the base of the antenna above the highest occupied point on the ground surface.

6. RECOMMENDATIONS.

a. AN/FPS-6 (Army Tower No. 1).

(1) When maintenance personnel are required to work on the antenna of this set, arrangements should be made with Air Force personnel not to beam the AN/FPS-6 in Air Force Tower No. 1 at Army Tower No. 1.

(2) The above precaution is not necessary as long as all personnel are within 10 feet of the radome floor.

b. AN/FPS-6 (Army Tower No. 3.). Potentially hazardous power density levels do not exist in this tower and therefore no special precautions are necessary.

c. AN/FPS-24 and AN/FPS-26. It is recommended that when these radars, which are now under construction are operational, that this installation be resurveyed to determine if any additional potential hazards areas would exist.

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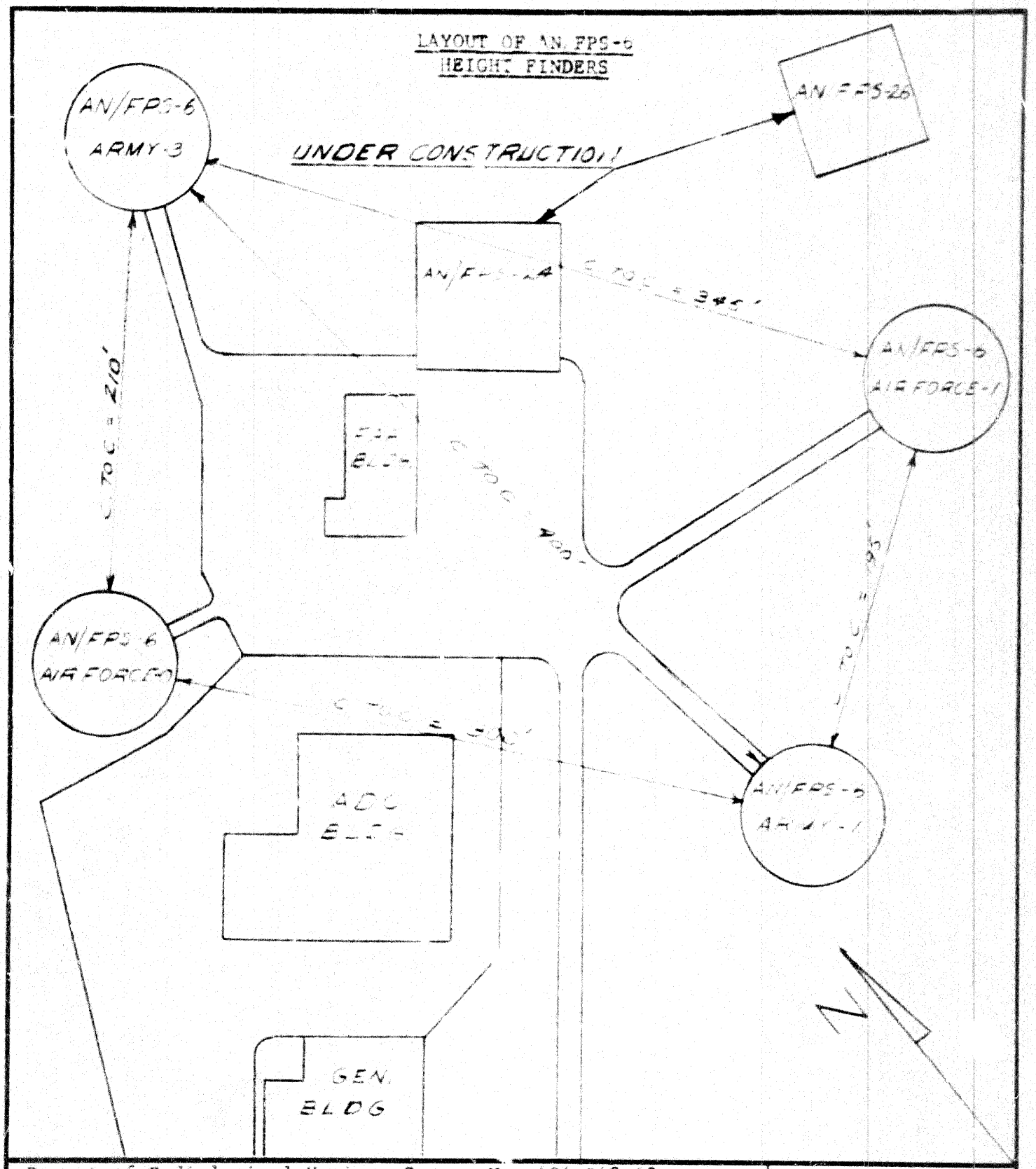
*All measurements were made with the antenna of the source radar stationary in both azimuth and elevation. In all cases, the source antenna was set to minimum elevation (-2°), in order to position the main beam axis at the point of measurement. With the source antenna positioned as mentioned above, power density measurements were made within the radomes of adjacent radar towers.

APPENDIX I



Report of Radiological Hygiene Survey No. 4040R42-62
Missile Master, Pittsburgh Sec, 31st Brig, Oakdale, Pa.
26 February - 1 March 1962

U.S. ARMY ENVIRONMENTAL HYGIENE AGENCY

UNITED STATES ARMY MEDICAL SERVICE

DATE	26 Feb-1 Mar 62
DRAWN	RGB
APPROVED	RSP
SCALE	None
PLATE	R-682

APPENDIX II

FIELD MEASUREMENTS

Test Location	Source Radar	Distance To Test Point (feet)	Height Above Radome Floor (feet)	Power Density (mw/cm²)
AN/FPS-6 (Army #1)	AN/FPS-6 (Air Force-1)	195	12.0	11.2
		195	10.0	10.0
		195	6.0	1.25
	AN/FPS-6 (Air Force-0)	300	10.0	5.6
		300	9.0	7.9
		300	6.0	4.0
	AN/FPS-6 (Army-3)	400	12.0	2.5
		400	10.0	1.4
		400	6.0	1.0
AN/FPS-6 (Army #3)	AN/FPS-6 (Air Force-1)	345		0*
	AN/FPS-6 (Air Force-0)	210	12.0	5.6
		210	10.0	5.0
		210	6.0	2.0
	AN/FPS-6 (Army-1)	400	12.0	1.1
		400	10.0	1.0
		400	6.0	1.0

* This zero reading is due to the location of the FPS-24 tower which blocks radiation between the Army-3 and Air Force-1 towers.

APPENDIX III

OPERATING PARAMETERS OF AN/FPS-6

Peak Power	5 megawatts
Average Power	3.6 kilowatts
Pulse Repetition Rate	360 pulse/second
Pulse Width	2 microseconds
Antenna Dimensions	30' x 7.5'
Antenna Gain	38.5 db
Beam Width	
Horizontal	3.2°
Vertical	0.85°
Nod Rate	20 - 30 nods/minute
Vertical Scan	-2° to +32°
Frequency	- S Band

At the time of the survey the two Air Force AN/FPS-6 sets were operating at an average power of 3.2 kilowatts and the two Army AN/FPS-6 sets were operating at an average power of 2.6 kilowatts.

USAEHA-MR Rept of Rad Hyg Sv #4045R4?-62 (MM, Pittsburgh Sec, 31st Brig, Oakdale, Pa) dtd 26 Feb - 1 Mar 62

Richard G. Berkley

RICHARD G. BERKLEY
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Health Physicist

William A. Palmisano

WILLIAM A. PALMISANO
Electronics Engineer

APPROVED:

Charles W. Kraul

CHARLES W. KRAUL
Lt Colonel, MC
Commanding

Mr. Palmisano//jp/26232

1 FEB 1962

USAEHA-SR

SUBJECT: Microwave Survey

TO: Commanding Officer
16th Artillery Group
ATTN: S-3
Carlisle, Pennsylvania

1. A microwave evaluation of your installation has been requested by the US Army Air Defense Command Surgeon. The Surgeon General has authorized this Agency to perform this service as requested.

2. A microwave survey is proposed at your installation during the period 19-23 February 1962 by Mr. William A. Palmisano, Electronics Engineer, and 2d Lieutenant Richard G. Barkley, 02326161, MSC, Health Physicist, of this Agency.

3. These personnel will arrive at your installation via private automobile.

4. Mr. Palmisano and Lieutenant Barkley are cleared to receive information and material up to and including SECRET.

5. If the proposed dates are not satisfactory, please advise in order that acceptable dates may be arranged.

CWK

CHARLES W. KNAPP
Lt Colonel, MC
Commanding

Copies furnished:
CG, 2d US Army
ATTN: Surgeon
CG, USA DARCOM
ATTN: Surgeon

Mr. Palmisano WP
Col Penner
Dir Med Svc
Sci Dir

42

FILE