MARSHALL ISLANDS FILE TRACKING DOCUMENT

Record Number: 405

File Name (TITLE): Report of Evacuation Plan Conference

Document Number (ID): 126475

DATE: none

Previous Location (FROM): CIC

AUTHOR: JTF 132

Addditional Information:

OrMIbox: 21

CyMIbox:

Headquarters
TASK GROUP 132.1
Joint Task Force 132
Los Alamos Scientific Laboratory
J Division, P.O. Box 1663
Los Alamos, New Mexico

H1-LB-2 PL

J- 12372

[redacted]

Subject: Report of Evacuation Plans Conference.

To: COMMANDER
JOINT TASK FORCE 132
Washington, D. C.

RESTRICTED DATA
This document [illegible] data as [illegible] Act of 194[illegible] the disclosure of its [illegible] any manner to an unauthorized person is prohibited.

THIS DOCUMENT CONSISTS OF 26 PAGE(S)
NO. [illegible] OF [illegible] COPIES, SERIES [illegible]

126475

DELETED VERSION ONLY

1. On the 10th of June, 1952, a conference was held at the Los Alamos Scientific Laboratory for the purpose of discussing IVY evacuation planning in so far as such plans are dependent on effects predictions of blast, thermal, water waves, and radiological conditions. The agenda is attached as enclosure #1.

2. It was the concensus of the recognized authorities in the respective fields that results expected at Eniwetok from Mike shot are, in brief, as follows:

YIELD

Expected [redacted] Reasonably possible maximum [redacted] Above [redacted] in the region of remote possibility.

BLAST

(Authority: Lt.Col. Francis Porzel, Group Leader, Blast Measurements Group, Los Alamos Scientific Laboratory)

5 MT yield - On Eniwetok 0.7 p.s.i.

10 MT yield - On Eniwetok 0.9 p.s.i.

40 MT yield - On Eniwetok 1.5 p.s.i.

For p.s.i. effects on Parry, add a factor of 15% to above Eniwetok predictions.

.7 p.s.i. - Breaks glass; tears loose canvas. Little, if any, buckling of metal buildings. Peak equals wind of 40/50 mph but of momentary duration comparable to a short gust. For detailed calculations

[redacted]

and recommendations for specific equipment protection, see Annex "A".

Conclusion: Structural damage on Parry and Eniwetok very minor. Take such measures as are reasonably easy to take -- labor-wise, time-wise, and small expense.

THERMAL

(Authority: Lt.Col. Francis Porzel - representing the Thermal Group of Los Alamos Scientific Laboratory)

DELETED DELETED

[redacted] (It takes about 8 calories per cm^2 to char wood). For detailed thermal effects, see Annex "A".

Conclusion: No precautionary measures are required on Parry and Eniwetok. Will not damage motor vehicle tires. No effect on vapors coming out of gasoline storage tanks.

WATER WAVE EFFECTS

(Authority: Dr. Roger Revelle, Scripps Institution of Oceanography)

Engebi	100 ft. wave
Rojoa	50 ft. wave
Runit	30 ft. wave
Japtan	17 ft. wave
Parry	17 ft. wave
Eniwetok	16 ft. wave

Breakers will be twice size; not dangerous at Eniwetok, Parry, or Japtan. Amount of yield above 5 MT has no effect as size of wave is limited by depth of lagoon. After three or four waves, size falls off rapidly. Engebi will be covered by a wash. None of Eniwetok, Parry, or Japtan will be covered by wash.

Small boats hauled up on 9 ft. high beach are safe; however, a more practical solution presented was that of anchoring the craft in deep water not less than 50 feet without any other special precautions.

Conclusion: There is no expected danger ashore from wave action on Eniwetok, Parry, or Japtan. No danger is anticipated to anchored small craft except possible anchor drag.

2

FALL [redacted]

(Authority: Commander Russel H. Maynard, Headquarters, JTF 132)

Maximum expected on Eniwetok and Parry with worst probably wind condition is delayed airborne contamination that could raise the level of the island to 4r/hr after 10 hours or same level out at distance of 180 miles.

Rad-safety limits of exposure are: .3r/week on life time basis. Total allowable one time dosage for IVY is 3r measured gamma only with special provision for pilots of sampling aircraft of 20r measured gamma only. A one time dosage of 25r is currently used in civil defense concepts of operations but is not applicable as a general guide in IVY unless as an accident. However, no one is expected to be exposed to radiation rates approaching 4r/hour. If such levels as these should be experienced on the islands of Eniwetok and Parry, a level of 4r/hour after 10 hours does not actually decay very rapidly according to calculations for such delayed fall out. However, from actual field experience, it has been found that weathering (i.e., wind, rain showers, etc.) of such fall out on the ground reduces the levels by more than 50% in one day or according to tables:

10 hours = 4 r
20 hours = 2 r
40 hours = 1 r
80 hours = .5 r

Little is to be gained by covering large regular objects since when the reentry can be attempted for persons, levels of radiation on the equipment will in general be low. However, where equipment open to airborne contamination is complex, such as radio consoles or power control banks or motor generators, fall out contamination can be materially reduced from collecting in such inaccessible spots by some covering. Hoods, when closed, on vehicle engines should suffice to reduce oily, greasy surfaces

[redacted]

from collecting and holding contamination after all other surrounding areas have weathered down to insignificant levels. Food in reefers is considered safe from contamination. In general, common sense rules should govern in trying to hold down man hours to be spent in decontaminating inaccessible spots where personnel must later work, and this should be balanced against cost of manpower and material in preventing contamination.

Salvage canvas, where available, should be used to cover equipment which has inaccessible spots (perhaps oily or greasy spots) which are likely to collect airborne fall out and which will be difficult to decontaminate. It may be necessary to procure additional material for covering, should insufficient salvage material be available.

GENERAL

With regard to blast , thermal, fall out hazards, such measures as are relatively easy to take, labor-wise, time-wise, and inexpensive, should be taken. With the exception of special equipment such as electronics gear, the hazard does not warrant a great amount of labor, time, or expense for the protection of structures, construction equipment, vehicles, and so forth.

Dr. Graves expressed his opinion that the island can be re-entered without hazard in 2 - 6 days after Mike shot.

Dr. Draves concurred in the above conclusions. Among other qualified scientific personnel present who offered no objection to the conclusions as they pertained to their respective scientific fields were:

[redacted]

4

Dr. Bergen Suydam, Dr. Fred Reines, Dr. George White, and Dr. Ted Shipman of the Los Alamos Scientific Laboratory, as well as Prof. J. B. Dias of the University of Maryland, Institution of Fluid Dynamics.

DC/PIH/by

DUNCAN CURRY, JR.
Chief of Staff

Distribution:

Copy	1 - 4	CJTF-132
	5 - 7	Holmes & Narver
	8 & 9	Sandia Corp.
	10	CTG 132.1
	11	CTG 132.2
	12	CTG 132.3
	13	CTG 132.4
	14	D. Curry
	15	H. Allen
	16	J-1
	17	J-2
	18	J-3
	19	J-Sequence
	20	LASL M&R

Distribution: (Series (B)).

Copy	1	Graves
	2	Burriss
	3	Forzel
	4	Tyler
	5	Reveille
	6	Suydam
	7	Reines
	8	Whit[redacted]
	9	Shipman
	10	Werner (NRDL)
	11	Hooper
	12	Rieder

Copy 13 and 14	TU 1
15	TU 2
16	TU 3
17	TU 4
18	TU 7
19	TU 8
20	TU 9
21	TU 10
Copy 22 to 25	TU 11
Copy 26 and 27	J-7

5

[redacted]

ANNEX "A"

ESTIMATE OF BLAST AND THERMAL EFFECTS ON MIKE SHOT - OPERATION IVY

by

Lt. Col. Francis B. Porzel, Group Leader, J-10, Blast Measurements Group, Los Alamos Scientific Laboratory

CHAPTER I

GENERAL

The large size of the Mike weapon, together with a considerable uncertainty in predicted yield, present unusual problems in estimating blast and thermal effects.

Because of the limited size of Eniwetok Atoll, one cannot afford the luxury of protecting island installations against any possible yield, and for that matter, it would be imprudent to attempt to do so. Fortunately, the blast and thermal effects scale in such a way that no prohibitive problems are introduced, but every reasonable precaution must be taken and ingenuity used to reduce the calculated risk to a minimum.

The Test Director has formulated the policy that personnel protection will be based on an absolute upper estimate of yield. Structures or things will be protected on the basis of a reasonably probable yield. The wisdom of this policy is especially evident in blast, where the structural criterion for damage is seldom known better than a factor of 2; for the marginal case at low pressures, experience indicates that the effort required to protect structures is usually much greater than the effort required to repair whatever minor damage might occur.

The most likely value of yield for Mike shot is of the order [redacted], and there is a very small probability that the yield may go as high as [redacted]. Both blast and thermal effects are such that the yield of [redacted] is reasonably safe. It is understood that should the probable yield later appear to be in the order of [redacted] Alamos Scientific Laboratory will so inform all test pe[redacted]nd the general conclusions of this paper should be reviewed at that time.

CHAPTER 2

BLAST EFFECTS

2-1 General

Certain factors lend simplicity to the estimate of blast effects on the Mike shot. Because it is a surface burst, a reflection factor of 2 has been assumed for these predictions, meaning that the blast wave is a hemisphere whose peak pressures and waveforms and radii are appropriate to a bomb of twice the yield in free air. Because of the large scaled size of the explosion, compared with the shot island, the burst is essentially over water, which is an excellent

[redacted]

reflecting surface in all respects. During the early strong shock phase, the rate of work by the shock front on air as compared to the rate on soil or water is in a ratio more than 10 to 1 in favor of air. It follows that less than 1 per cent of the energy will be transmitted to soil or water during these stages. Recent atomic tests have been concerned with the effect of thermal radiation in attenuating the peak pressures in a blast wave; this effect will be at a minimum on Mike shot because of the glancing angles of incidence of thermal radiation; however, the "thermal effect" will not be completely absent because the fireball attains a large vertical height in a short time.

Other factors lead to difficulty in estimating the effects. The rise of the fireball and consequent afterwinds lead to an attenuation of the blast wave at close distances which is difficult to estimate; this effect is at a maximum because of the low height of burst. Next, considerably higher temperatures may be achieved in this explosion than on an ordinary nuclear explosion; this leads to greater losses in energy through irreversible heating, to a different "partition of energy", to the possibility of a greater fraction of energy appearing as thermal radiation, and to the possibility of a smaller comparable blast yield. Again, the explosion is so large that the atmosphere can no longer be considered as homogeneous; the top of the blast wave will be in rarefied atmosphere at a time when ground pressures are still in the region of practical interest. Considerable blast experimentation will be devoted to this point which may lead to a variation of 25 per cent in yield. Again, atmospheric inversion may focus energy upward or downward at long distances, but for an ordinary bomb, this effect is usually at pressures near 0.1 psi. On Mike shot, the scaled height of these inversion layers are such that some focussing (or defocussing) of energy may occur at pressures of interest. Finally, on the space scale involved here, layers of clouds are close enough to be of some concern both from the standpoint of energy reflection as well as from the standpoint of providing a shield from thermal radiation.

For the most part the uncertainties listed are expected to be in the order of 25 to 50 per cent in blast yield, and small compared to the design uncertainty of [redacted] and not sufficiently large to require specific numerical treat[redacted]

For the most part, the data used in making these [redacted] were taken from IBM problem M, which was assumed to be [redacted]. This is conservative because it implies that blast efficiency of an atomic bomb is 0.65 compared with TNT. The actual efficiency may be as low as 0.5 for a conventional weapon and perhaps lower for a very large weapon. Moreover, experiments on structures are usually based on pressure gauge readings, and these are generally lower, perhaps 20 per cent, than the "ideal" values quoted here.

7

[redacted]

2.2 Derived Curves

2.2.1 Peak Overpressure vs Distance

Figure 1 shows the peak [illegible] as a function of distance for [illegible] yields [illegible] these values have been taken from the IBM solution [illegible] with other curves which follow) these predictions are in [illegible] agreement with predictions made on the basis of [illegible] substantial difference [illegible] small enough that the pressures [illegible] surface. In this case the explosion [illegible] theory indicates that somewhat higher peak pressures [illegible] than if the explosion occurred entirely over land [illegible] within the first few miles from the bomb, the peak pressures may be reduced considerably from the value shown here by the thermal effect on the ground prior to shock arrival. At long distances, such as at Parry and Eniwetok, the pressures may be lower or higher for reasons cited in Sec. 2.1 above. However, at long distances, the peak pressure is a slowly varying function of yield, such that an eight-fold increase in yield merely doubles the pressure.

2.2.2 Peak Material Velocity vs Distance

Coincident with the arrival of the shock wave is a wave of material velocity whose peak value as a function of distance is given in Fig. 2. The relationship between peak material velocity and peak pressure is

$$u = \frac{5\,\frac{\Delta P}{P_o}}{\sqrt{7\left(6\frac{\Delta P}{P_o} + 7\right)}}\; c_o$$

where

u = material velocity

C_o = ambient sound velocity

$\Delta P/P_o$ = overpressure, in atmospheres

The duration of this wind is comparable to the positive duration of the blast pressure.

2.2.3 Pressure vs Time

Figures 3, 4, 5, and 6 give estimates for the pressure vs time wave at selected pressure levels of 1,000, 100, 10 and 1 psi and indicate the variation in the form of the pressure wave at these pressure levels. At high pressures and close in there is no negative phase; pressure decays assymptotically to zero. Moreover, "length of the positive phase" is strongly influenced in this region by the rise of the fireball, which attenuates pressures shortly after shock arrival, and should reduce the

[redacted]

"length of the positive phase" within the first few [illegible] the [illegible] effect will lead to a marked alteration of peak pressures and the [illegible] rise in pressure, instead of the ideal [illegible] shown here. At slightly greater distances, the thermal effect will result in a "partial shock" rather than a completely slow rise. Still further, the shock front will be sharp as shown here. At far distances the negative phase increases and eventually the positive and negative impulse under the blast wave become equal.

In translating these curves to different yields, both the distance and time must be [illegible] by $W^{1/3}$ holding pressures constant. In many cases, the criterion for structural damage is not simply peak pressure, but the product of the air density and the square of the material velocity $\frac{1}{2}\rho u^2$. This blast wind results in a dynamic pressure on structures; the time variation of this dynamic pressure may be taken as approximately similar to the pressure-time curves shown here.

2.2.4 Time of Arrival

Figure 1 gives the time of arrival of the shock wave as a function of distance. These curves are based on calculations from peak pressures observed on tower shots, but are in good agreement with the time-of-arrival curve as predicted from the IBM run using this yield. Unlike peak pressures, the observed time of arrival should be independent of the type of surface.

2.2.5 Positive Duration

Figure 8 shows the duration of the positive phase of the blast wave as a function of distance from the bomb. The upward swing of this curve at short distances is associated with the lack of a negative phase at this point. Where accurate estimates of the pressure decay is required at close-in distances, the pressure-time curves may be fitted by a power law or semi-logarithmic plot. For example, the curve shown for 1,000 psi can be fitted initially by

$P \sim 1/t^{.68}$ and later by $P \sim 1/t^{.8}$ or $P \sim P_s e^{-KT}$.

2.2.6 Positive Impulse vs Distance

Figure 9 shows the positive impulse, or $\int p\,dt$ as a function of distance. If further information is desired, such as the negative impulse, these values can be derived upon request.

2.3 Protection from Blast

2.3.1 General Rules

As pointed out earlier, every reasonable precaution must be taken against the blast effects and every method which ingenuity suggest should be used, but no prohibitive problems are presented by blast. It is impossible to point out here the criterion for all types of structures, but the following discussion shows the general character of the conclusions which may be expected. It is suggested that test personnel consider their individual structures on the basis of the field variables given in Figs. 1 thru 10.

2.3.2 Previous Experience

Some estimates for the damage on structures at different pressure levels are given in "Effects of Atomic Weapons"; a more complete table is available in Par. 48 and Table 9 of "Capabilities of Atomic Weapons", Department of the Army, Tech Manual TM-23-200, Department of the Navy, OPNAV-P-36-00-00, Department of the Air Force, AFOAT 385-2, July 1951.

It should be noted that structures fail from two causes; from peak pressure and from the winds following the blast wave. From the standpoint of pressures, the Mike shot presents no pressures much beyond present experience. According to Fig. 1, pressures on Parry and Eniwetok will be about 0.35 psi; pressures of 0.3 psi were observed on Parry and Eniwetok from Dog and George shots during Operation Greenhouse. A pressure of 0.8 was observed on Bijiri from Dog shot. In both cases, numerous structures were involved, which should furnish pertinent data. The reason for this small increase in peak pressure is because the increase in yield ($P \sim W^{1/3}$) is offset by the greater distance. (Elugelab is approximately 22 miles from Parry, compared with 9 miles on Runit.) With respect to wind loading, the situation is more serious because the positive durations scale like $W^{1/3}$, and are not offset by an increase in distance. The positive durations for 5 MT are 10 times longer than for 5 KT at the same distance.

2.3.3 Structures

Some general conclusions may be drawn with regard to structures. All ordinary window or plates glasses, especially in sizes over 12 in. are nearly bound to break, on Parry and Eniwetok. Where possible, walls facing the blast wave should be removed as well as walls directly behind it, in order to allow pressures to build up more rapidly within the structure, and to relieve the force from normal reflection of the blast. If this is not feasible all windows and doors should be left open. No canvas can be used unless it is strongly secured with at least grommet-type fastening; plenty of slack should be allowed, without taut surfaces; no large unsupported separations of canvas should be draped over frame work. All tents should be struck, (although tents were observed to survive at Nevada Test Site at approximately this pressure level, but much shorter duration). The use of berms or sandbagging to protect structures is of doubtful value; the waveform is so long that the peak pressure can build up behind the berm before any depreciably decay has occured; of course, some protection is afforded from the dynamic wind.

Small plywood structures have been observed to withstand 2 psi during some previous tests and although they failed at slightly higher pressures, they did so through multiple reflections from corners. Door frames and hinges fail readily if exposed to the blast much above 1 psi. Holmes and Narver reports no damage on the hanger at Eniwetok from 0.3 psi on previous shots. At the 0.8 psi level they report that structures bowed on a large wall facing the blast.

[redacted]

It is noted that structures do not fail at some critical pressure level, but that over a range of pressures (perhaps a factor of 3), the damage is somewhat proportional to the pressure. The observation on structures at low pressure levels can be extrapolated with some degree of confidence without expecting a sudden and complete collapse. In most cases, there is always some weak element on a structure which will fail first, such as blowing in of a panel in stress.

2.3.4 Vehicles

There is of no apparent requirement to evacuate vehicles from Parry to Eniwetok nor any appreciable advantage in doing so. All canvas tops should be removed from the vehicles. Windshields should be lowered flat or removed entirely. The vehicle should face directly away or toward the blast although it is felt that better protection for the radiator and headlights is afforded if the vehicle is facing away from the blast.

2.3.5 Aircraft

All aircraft should be evacuated wherever possible. For small aircraft (including helicopters) which cannot be evacuated, the main wings should be removed, and if left in the open, the aircraft should face toward the blast.

2.3.6 Boats

No damage is expected to hulls or any part of water craft which is usually subjected to wave action. The .7 psi level is equivalent to a head of a 1/2 foot of water which such boats habitually withstand. The superstructures of these craft are more susceptible to blast damage but we recall that the unbalanced peak pressure is of very short duration, small objects being rapidly engulfed by the pressure wave; for example, a mast of 3 in. in diameter will feel the peak pressure for approximately 3/4 of a millisecond. Following the peak pressure the blast winds will be of the order of 40 to 50 miles per hour at Parry or Eniwetok but these craft habitually withstand these winds.

2.3.7 Storage Tanks

Storage tanks for fluids should be left full, both to add mass as well as to prevent the plates from buckling in.

CHAPTER 3

THERMAL EFFECTS

3.1 General

Like blast, an estimate of thermal effects required answers to certain uncertainties which will be settled by some of the experiments on the Operation itself. Fortunately, again, the estimates for thermal radiation are sufficiently low that no prohibitive problems are introduced.

[redacted]

There is an uncertainty in scaling radiation which involves whether the thermal yield is proportional to radiochemical yield or proportional to some lower power such as $W^{.73}$. In this paper, the theoretical upper limit is assumed and this in itself may give values 2 to 7 times higher than actually obtained. There is also an uncertainty regarding the transmission of air, because the fireball rises rapidly to great heights. Near the surface of the water, transmission is quite low, but several hundred feet above the water the transmission increases markedly. The transmission assumed here is for very clear air and considered reasonably safe. Although Elugelab is several hundred feet below the horizon at Eniwetok, no protection is afforded from thermal radiation because the fireball rapidly grows to a diameter many times this value.

A distinctive feature of the thermal radiation on this explosion will be the long time scales involved, nearly 10 times that from a 5 KT bomb. It may be possible to see the light minimum and the subsequent increase to maximum radiation, around 2 seconds. The thermal radiation will persist for some 30 seconds instead of the 3 seconds for conventional size weapons. Personnel should be warned that it is necessary to keep on the dark goggles for much longer periods of time than for conventional size weapons.

3.2 Total Thermal Radiation vs Distance

Figure 10 shows the total thermal radiation in calories/cm^2 as a function of distance from the bomb. These curves have been derived using the assumption that the total thermal radiation will represent [redacted] of the total yield. The dotted lines represent the values of the thermal radiation which would be received if one completely neglected absorption of thermal radiation by air. The full lines are based on a transmission of 80 per cent per mile, and corresponds to a very clear atmosphere. The full lines are considered reasonable estimates for structures near the ground. The dotted lines are an exaggerated upper limit, more appropriate to high flying aircraft.

3.3 Temperatures of Surfaces Exposed to Thermal Radiation

Both the "Effect of Atomic Weapons" and "Capabilities of Atomic Weapons" contain tables which give the critical energies in calories/cm^2 for a number of common materials such as wood, cloth, rubber, and plastics. The long duration of thermal radiation of this weapon has the effect of increasing these critical energies by a factor of 3 above the critical energy required on a conventional size weapon. The total thermal radiation occurs over longer periods of time, this permits correspondingly longer periods for heat to be conducted away from the surface and into the interior of their radiated object. For substances which are not shown in such tables the average surface temperature may be estimated roughly from the following equation:

$$T_s = \frac{aQ_T}{W^{1/6}} \sqrt{\frac{1}{h\rho\sigma}} \cos\theta$$

[redacted]

Where

a = absorptivity of the surface

T_S = surface temperature, degrees centigrade

W = radiochemical yield, kilotons

h = specific heat, cal/gm deg

ρ = density, gm/cm^3

σ = thermal conductivity, cal/cm, deg, sec

Θ = angle of incidence of thermal radiation of the surface.

Based on this equation and a yield in the order of 5 MT, Table 1 shows the relationship between the surface temperature and the total thermal radiation, for surface directly exposed to the radiation, where T_S is the rise in surface temperature in $^{\circ}C$, and Q_T IS THE TOTAL incident thermal radiation in cal/cm^2, as given in figure 10.

TABLE 1

Copper	T_S = 0.1 Q_T
Aluminum	0.1
Steel	0.4
[illegible]	5
[illegible]	10
[illegible]	[illegible]
[illegible]	[illegible]

[redacted]

[redacted]

The equation above is not strictly correct because it assumes that the thermal radiation rate is proportional to $1/t^{1/2}$. This is reasonable approximation after 2 seconds but prior to this time, the radiation rate varies in such a way that the surface temperatures may momentarily go to a value perhaps 3 times those estimated from the above equation.

Table 1 shows that the most critical materials are rubber and wood. For 5 MT yield, however, the temperature rise will be negligible for such materials on Parry and Eniwetok.

[redacted]

[redacted]

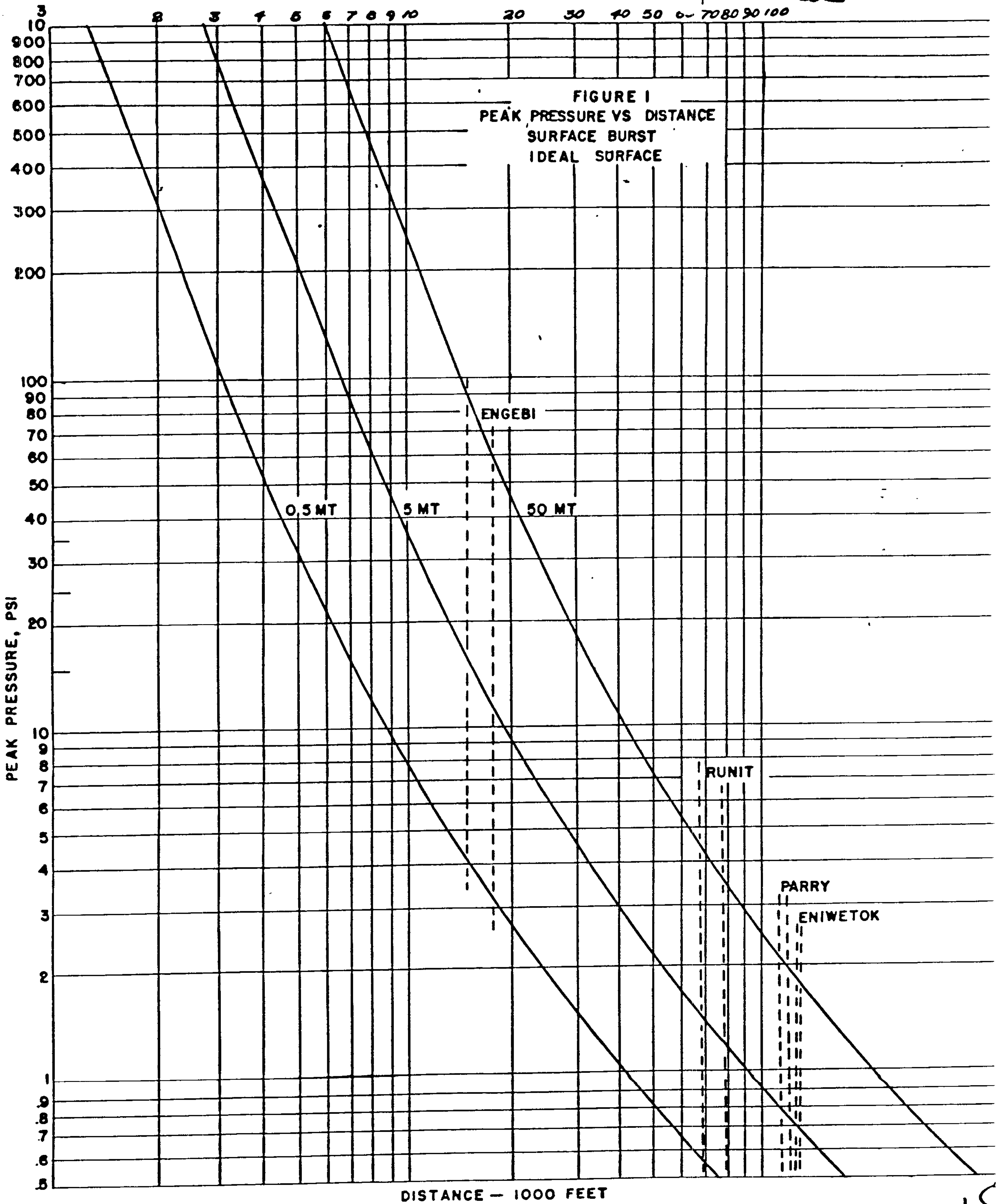


FIGURE I
PEAK PRESSURE VS DISTANCE
SURFACE BURST
IDEAL SURFACE

[redacted]

[redacted]

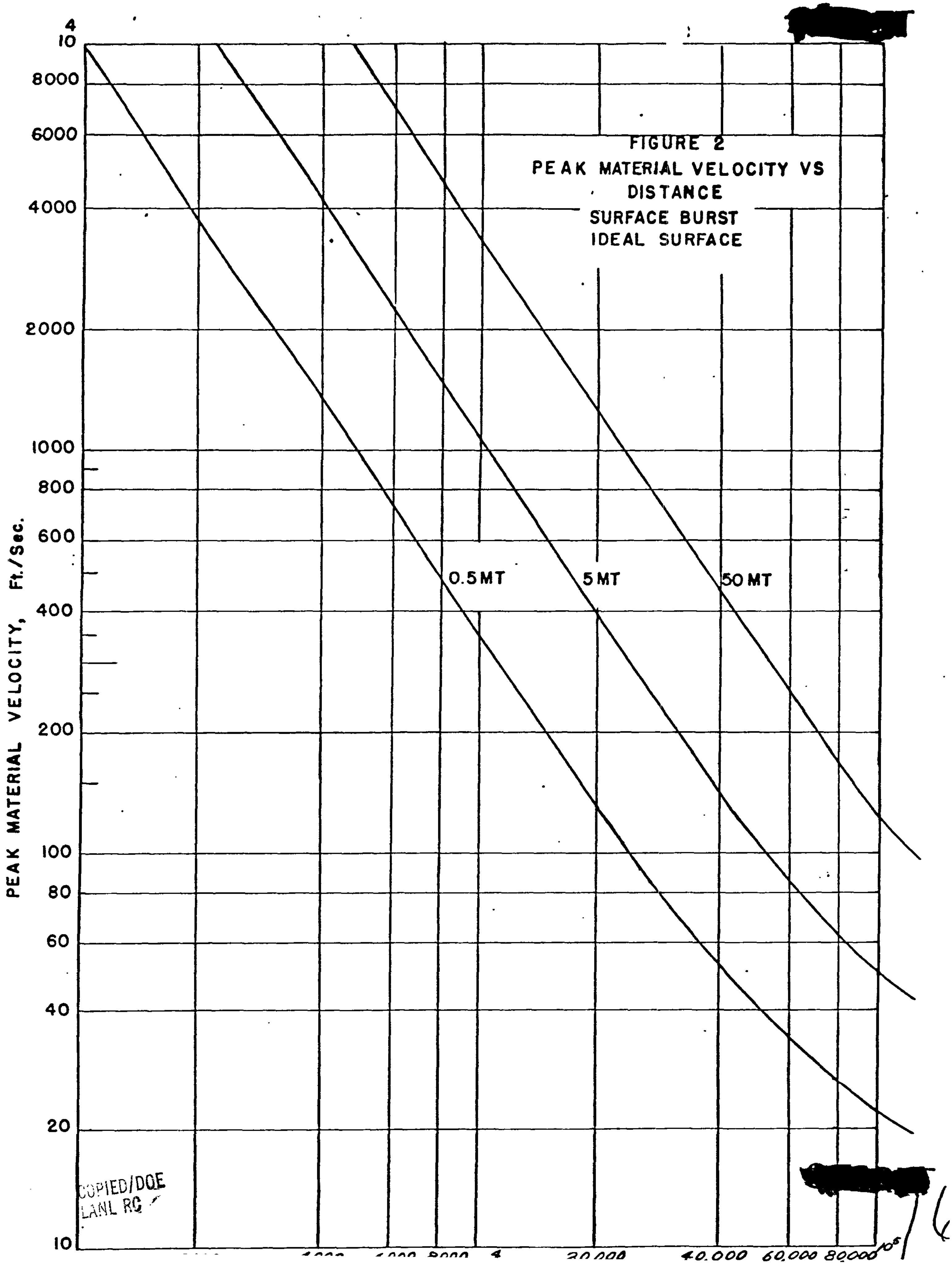


FIGURE 2
PEAK MATERIAL VELOCITY VS DISTANCE
SURFACE BURST
IDEAL SURFACE

[redacted]

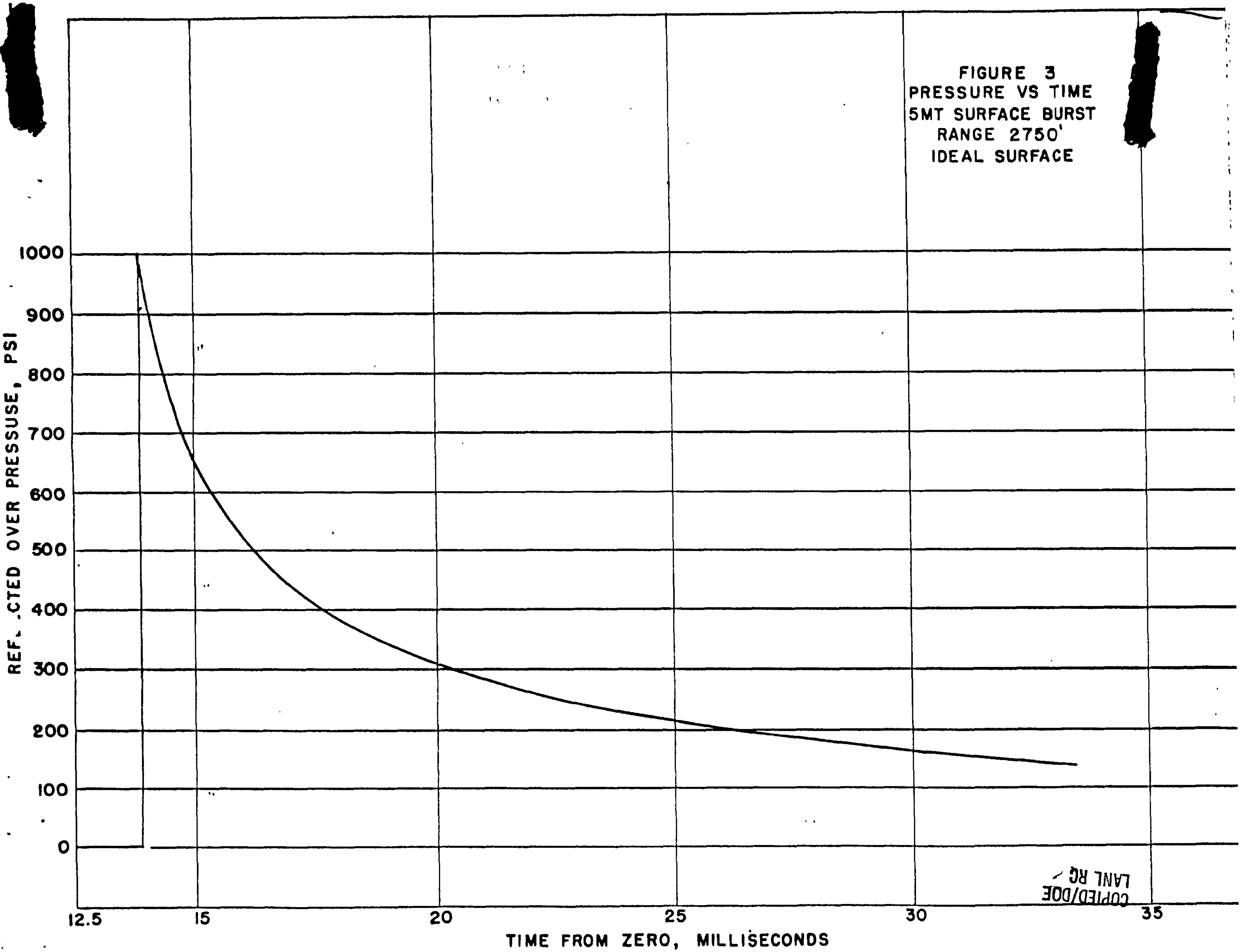


FIGURE 3
PRESSURE VS TIME
5MT SURFACE BURST
RANGE 2750'
IDEAL SURFACE

[redacted]

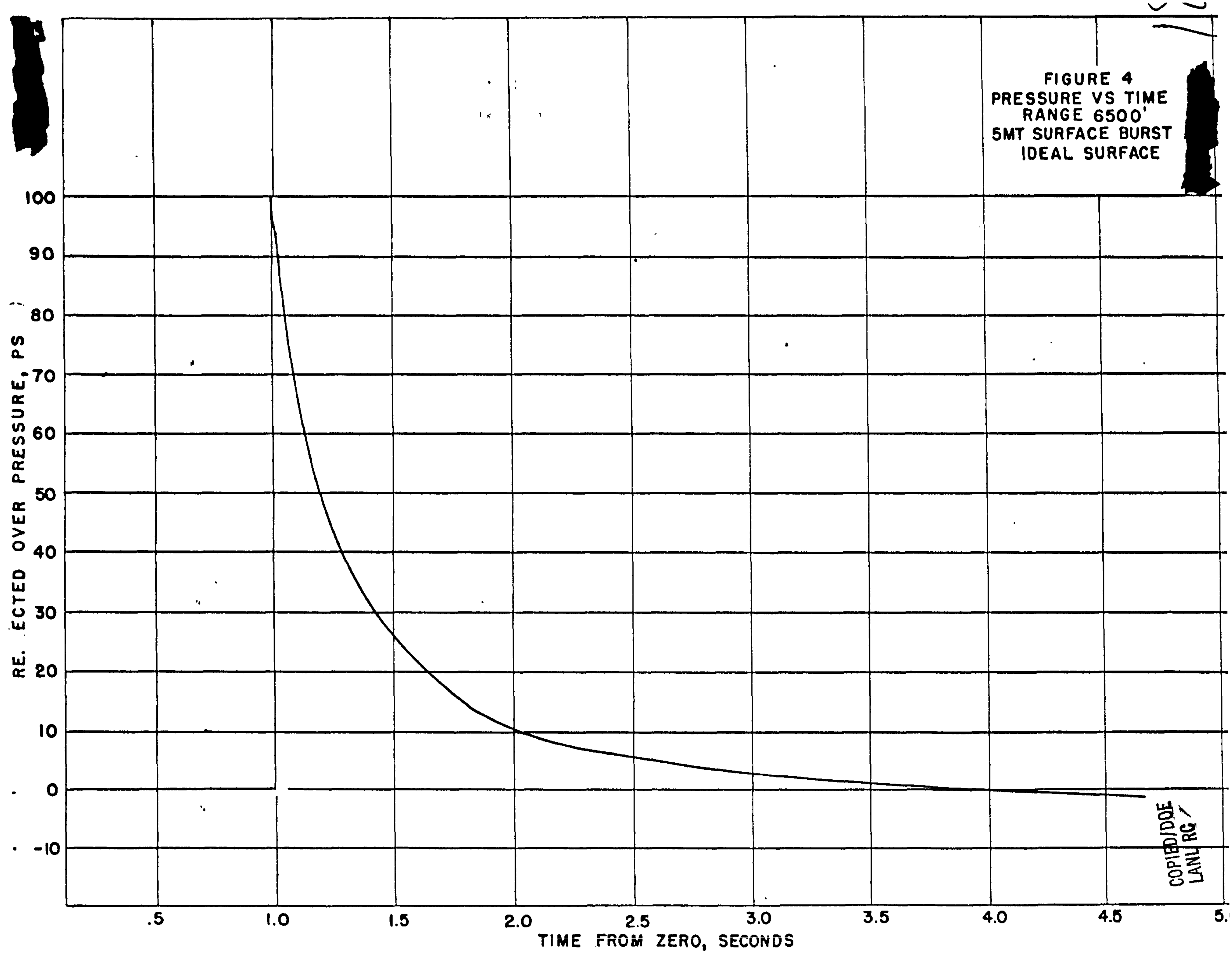


FIGURE 4
PRESSURE VS TIME
RANGE 6500'
5MT SURFACE BURST
IDEAL SURFACE

[redacted]

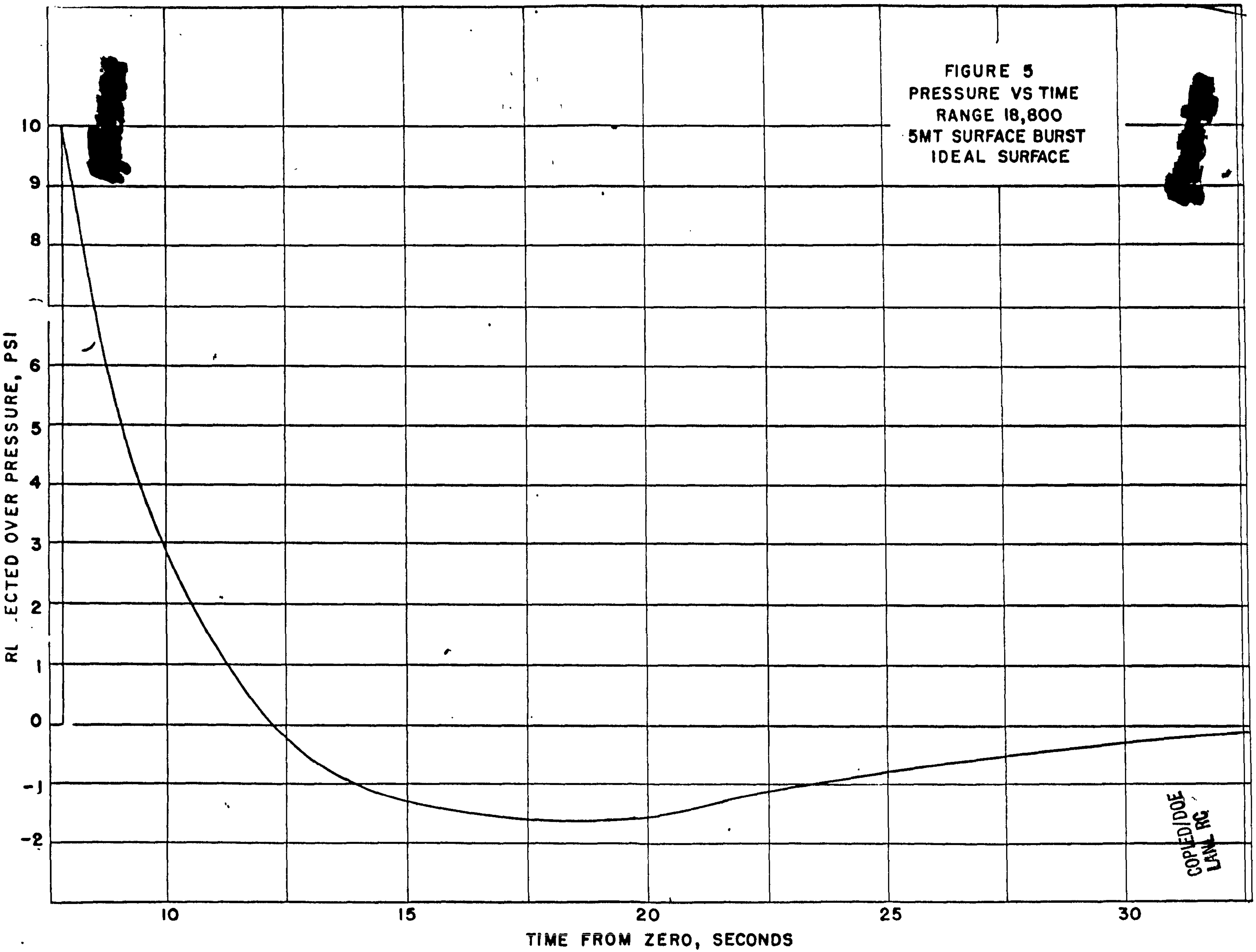


FIGURE 5
PRESSURE VS TIME
RANGE 18,800
5MT SURFACE BURST
IDEAL SURFACE

[redacted]

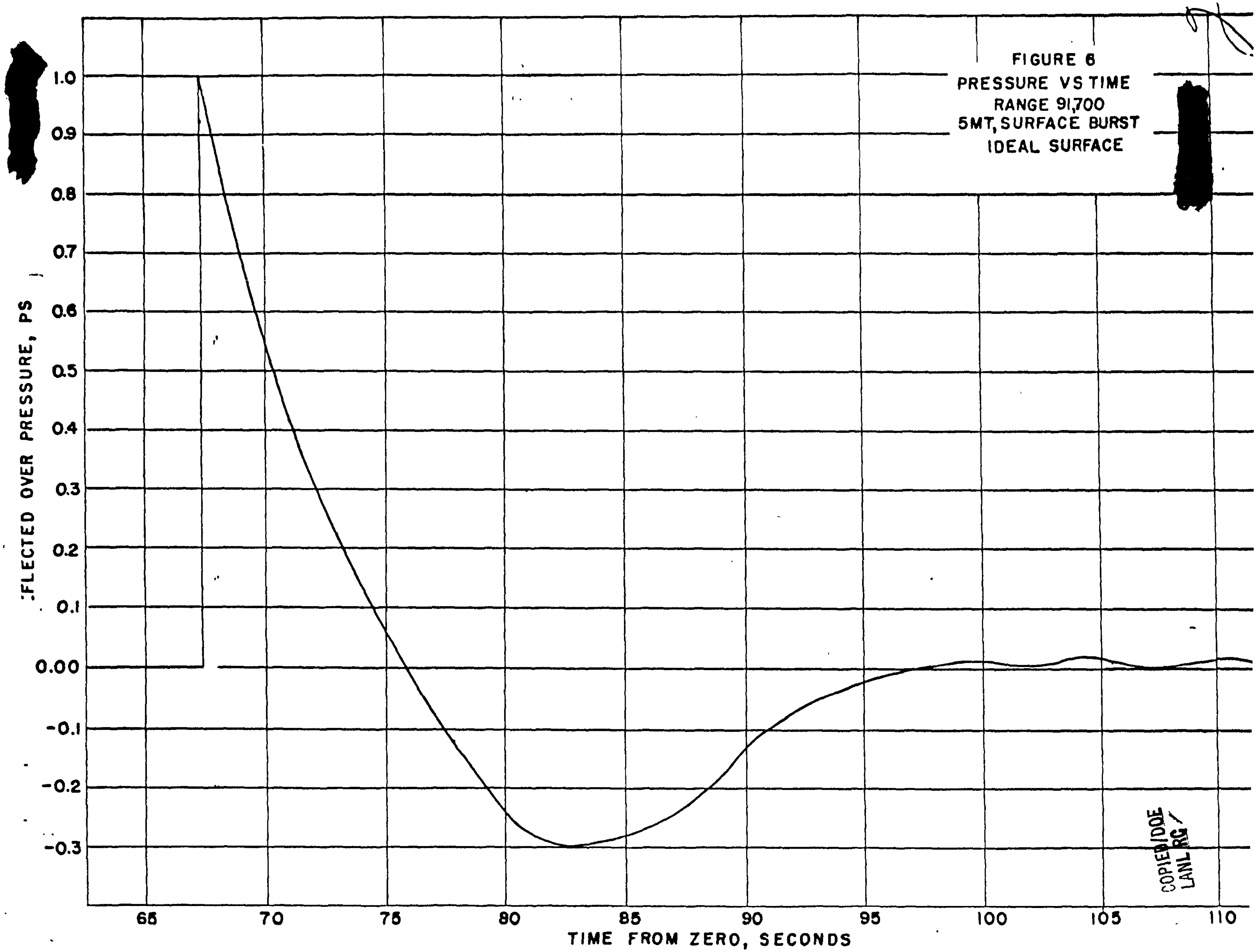


FIGURE 6
PRESSURE VS TIME
RANGE 91,700
5MT, SURFACE BURST
IDEAL SURFACE

[redacted]

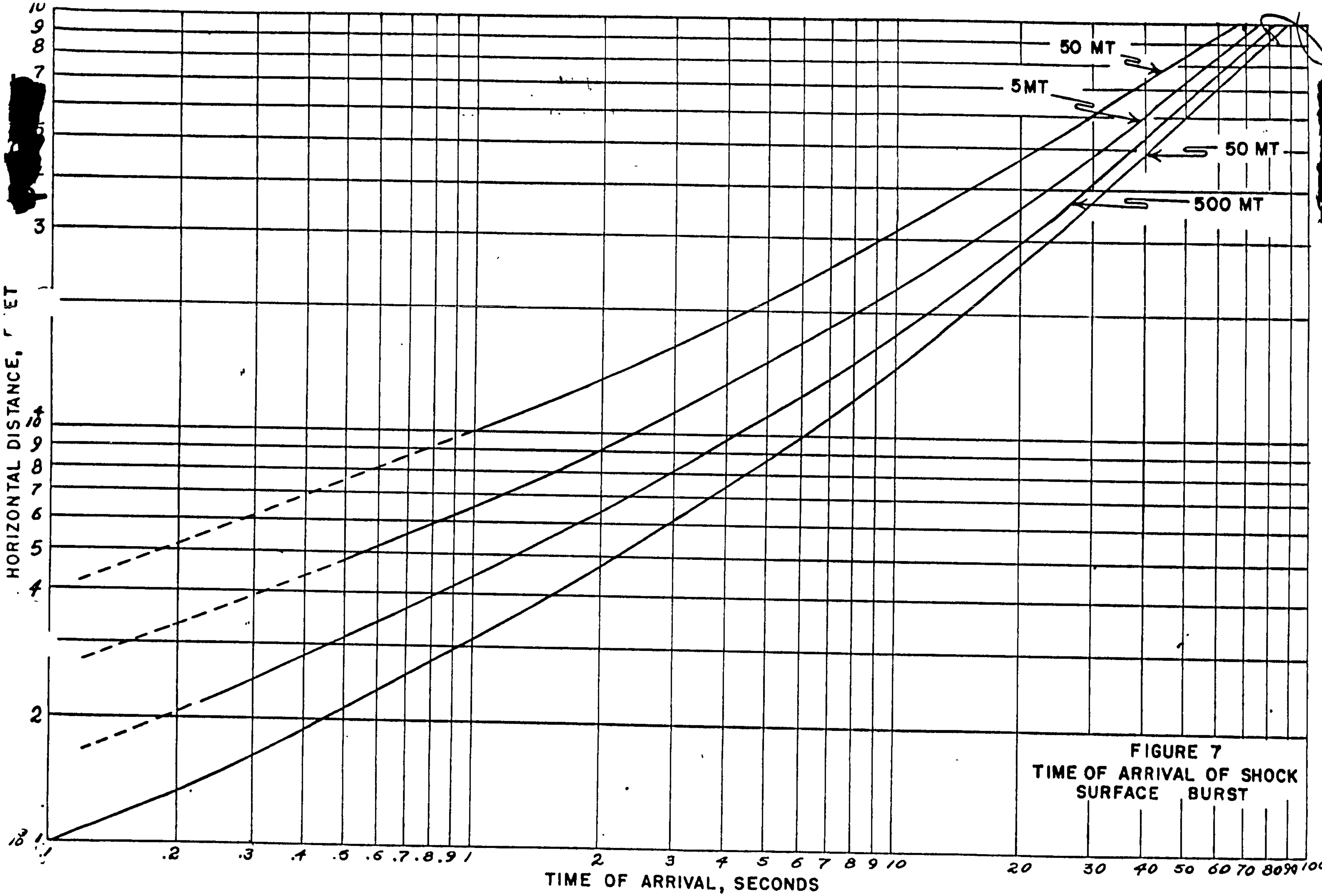


FIGURE 7
TIME OF ARRIVAL OF SHOCK
SURFACE BURST

[redacted]

[redacted]

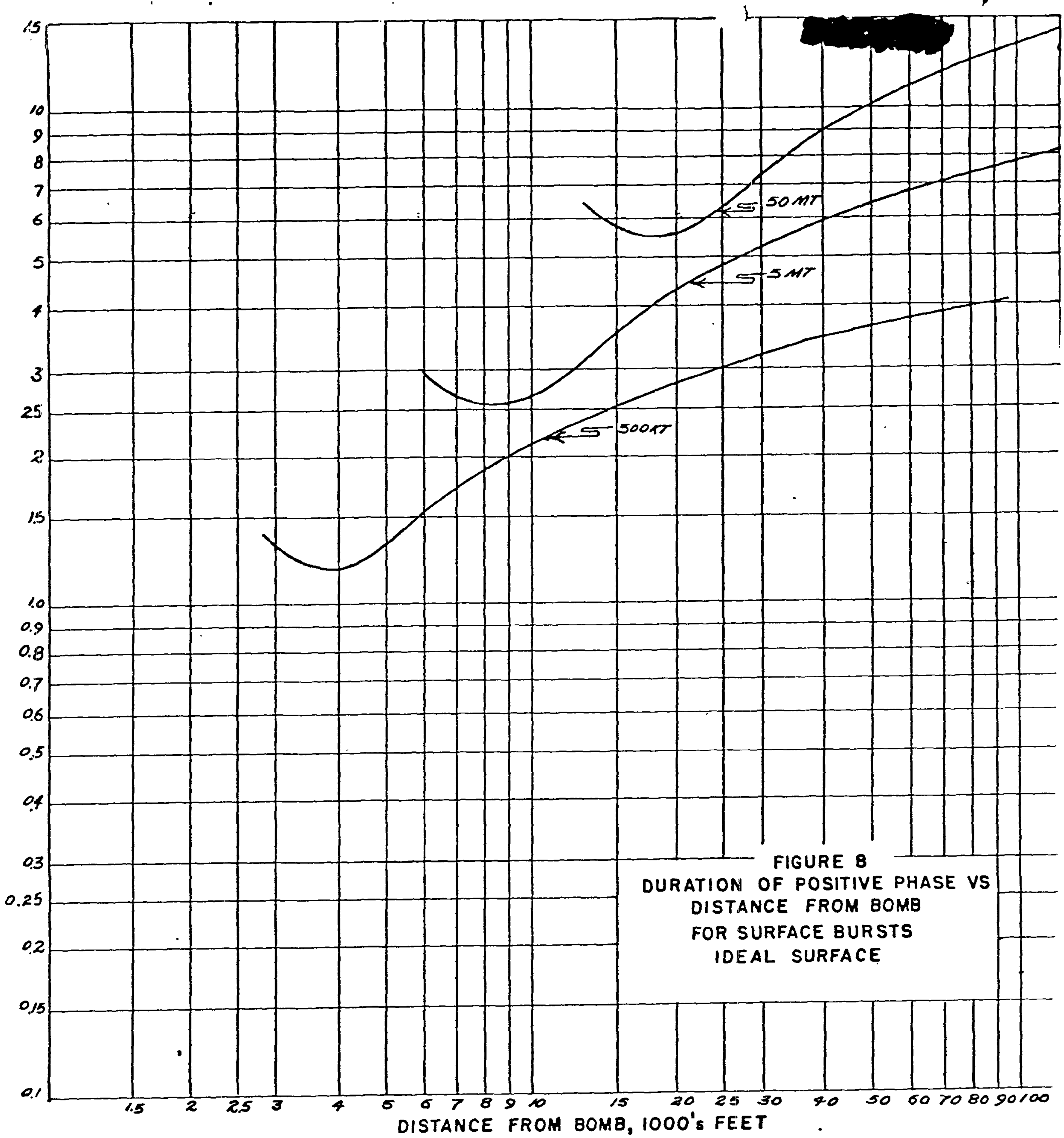


FIGURE 8
DURATION OF POSITIVE PHASE VS
DISTANCE FROM BOMB
FOR SURFACE BURSTS
IDEAL SURFACE

[redacted]

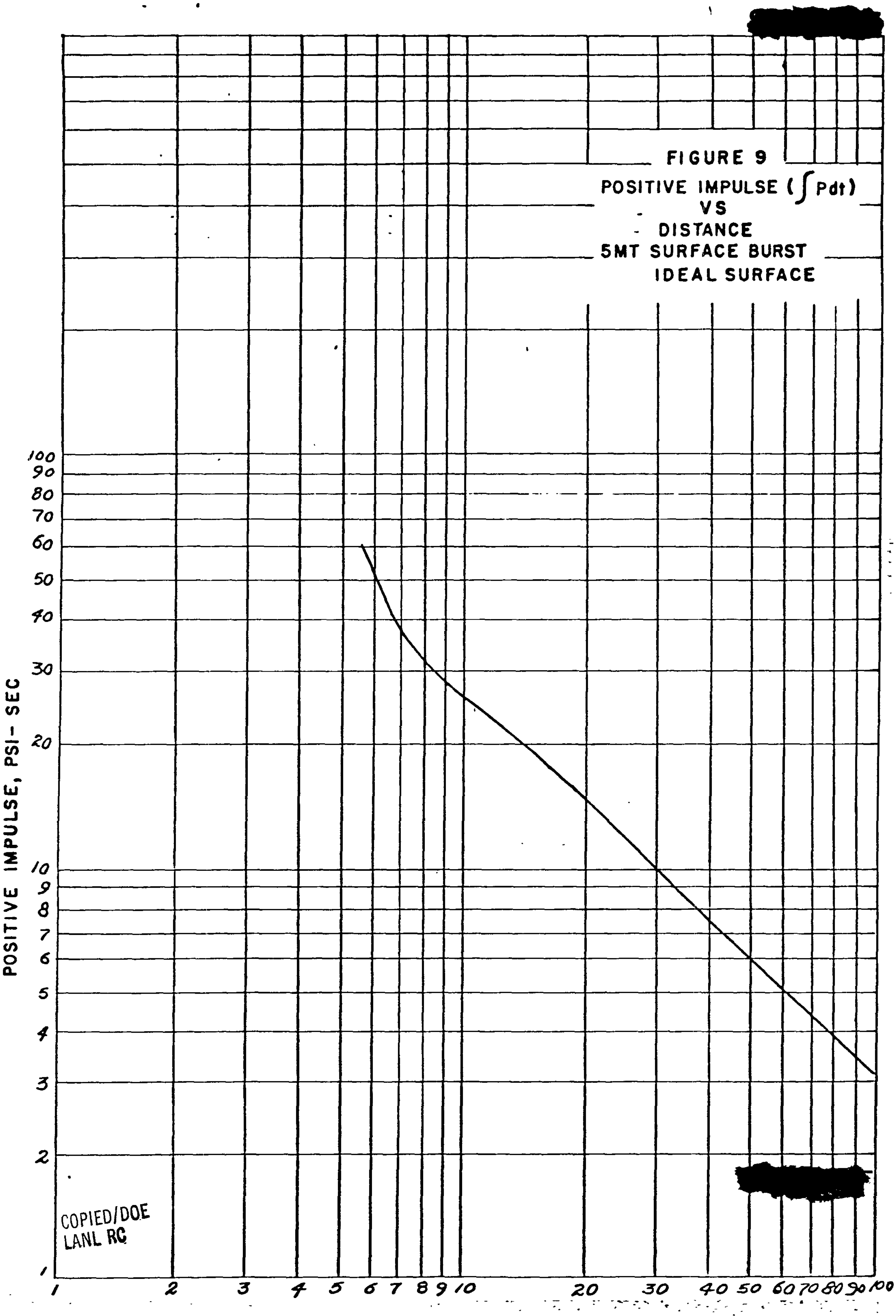
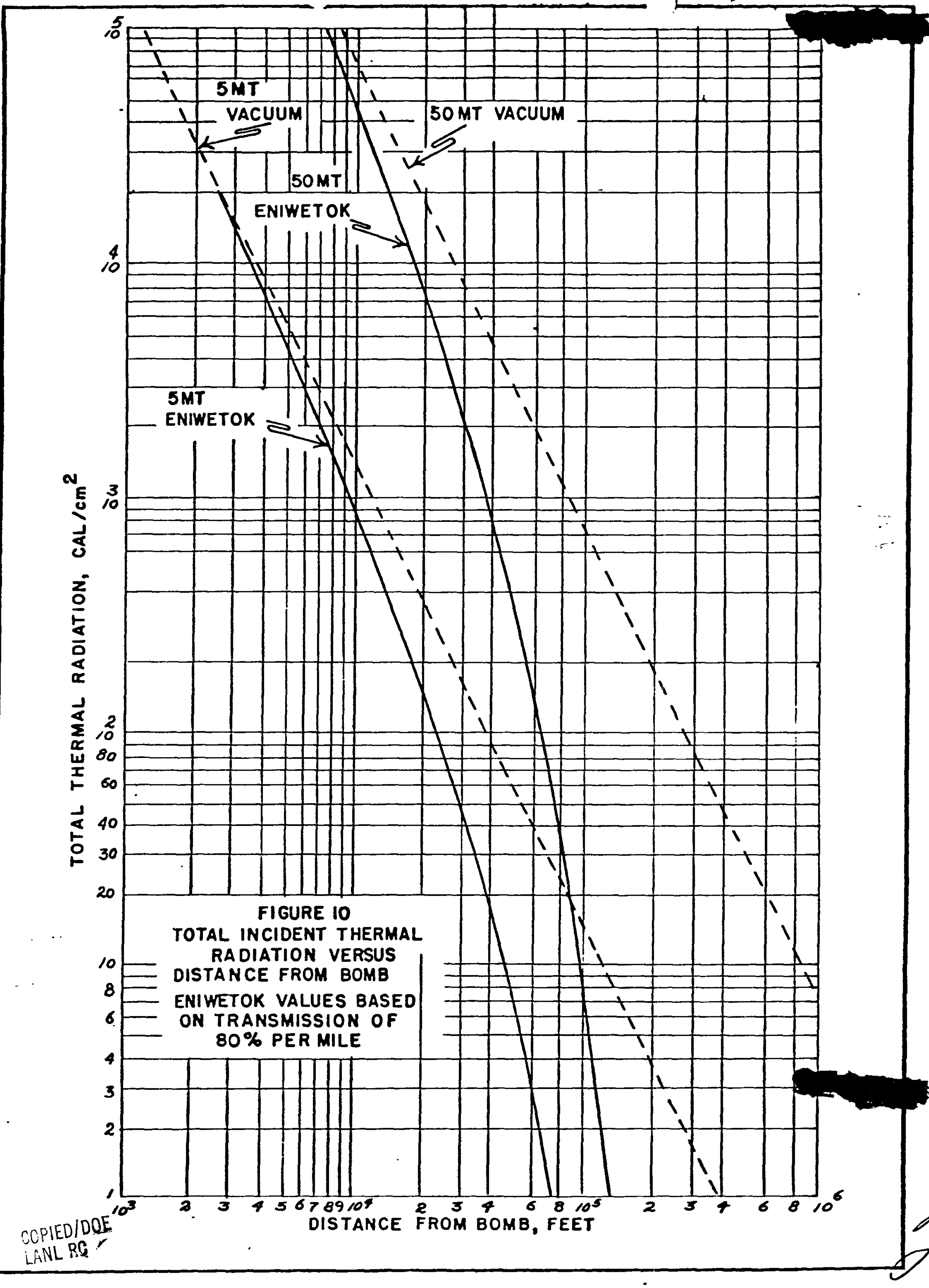


FIGURE 9
POSITIVE IMPULSE ($\int Pdt$)
VS
DISTANCE
5MT SURFACE BURST
IDEAL SURFACE

[redacted]



[redacted]

FIGURE 10
TOTAL INCIDENT THERMAL RADIATION VERSUS DISTANCE FROM BOMB
ENIWETOK VALUES BASED ON TRANSMISSION OF 80% PER MILE

[redacted]

9-10 June

- AGENDA -

[redacted]J- 12076 9 June 1952

Principal Organizations Represented:

Hq. JTF-132 - Maj. Gen. Clarkson
Hq. TG 132.1 - Mr. S. W. Burriss
SFOO - Mr. Paul Spain
Holmes & Narver - Mr. D. L. Narver, Sr.
Scripps Institution of Oceanography - Dr. Roger Revelle
Cambridge Corporation - Mr. Roger Warner
LASL - Representatives of Technical Divisions and Classification Office
Sandia Corporation - Dr. Everett Cox
University of Maryland, Institute of Fluid Dynamics - Prof. J. B. Diaz

9 June

1030 - P' Conference Room - Meeting of Scripps Institution personnel with Dr. George White of T-Division, LASL to discuss theoretical considerations and analysis of water wave studies (non-Q cleared personnel).

1100 - Room 117, B-Bldg. - Meeting of personnel of SFOO, Holmes and Narver, and LASL (Lt. Col. F. Porzel) to discuss blast effects of specific structures and equipment.

1330 - P' Conference Room - Meeting of personnel of Holmes and Narver, Scripps Institution, and LASL (George White) to discuss water wave effects of specific structures and equipment.

1500 - Room 117, B-Bldg. - Meeting of Mr. Narver, Paul Spain, Harry Allen, and Duncan Curry to discuss property and transportation matters pertaining to Task Group 132.1 activities.

- -

10 June

All meetings in S-Bldg. Conference Room located in the Tech Area.

With a view of all participants understanding the limited objective of this meeting attention is invited to the message addressed to Commander, JTF-132 from Commander, Task Group 132.1 (this message to be read by the chairman).

0900-0910 - Dr. Alvin Graves - Operation objectives of IVY.

[redacted]

[redacted]

0910-0920 - S. W. Burriss - Objectives of this conference.

0920-1000 - Lt. Col. F. Porzel - Blast and Thermal Effects.

1000-1020 - Lt. Col. F. Porzel - Question period covering Blast and Thermal Effects.

1020-1040 - INTERMISSION.

1040-1130 - Dr. Roger Revelle - Water wave analysis and theoretical predictions. - This presentation will include a short question period. Dr. White and Prof. Diaz will assist in the question period.

1130-1200 - Dr. B. R. Suydam - Radio-active Particulate Fall Out - This presentation will include a question period. Dr. Shipman and Dr. Tom White will be present for the question period.

1330-1430 - Cmdr. R. H. Maynard - Radiological Safety Considerations - Presentation to include a discussion period.

1430-1445 - INTERMISSION

1445-1500 - Phil Hooper - TG 132.1's Concept of Operations.

1500-1520 - Mr. Narver - H&N's problems.

1520-1530 - Mr. Roger Warner - Problems confronting the Cambridge Corp. with dewar evacuation and allied handling.

1530-1600 - Knickerbocker - Headquarters, JTF-132's problems.

1600-1700 - Discussion

- -

[redacted]