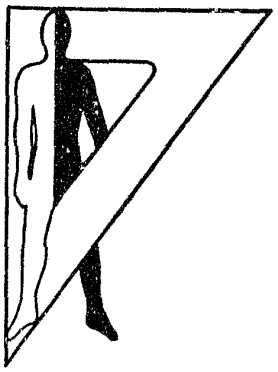

AD

Technical Memorandum 2-76

MODELING FOR LESS-LETHAL CHEMICAL DEVICES

$$\iint_A f(x, y)\, dA$$

Donald Campbell
Donald O. Egner

January 1976

U. S. ARMY HUMAN ENGINEERING LABORATORY
Aberdeen Proving Ground, Maryland

Destroy this report when no longer needed.
Do not return it to the originator.

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

Use of trade names in this report does not constitute an official endorsement or approval of the use of such commercial products.

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Memorandum 2-76	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* MODELING FOR LESS-LETHAL CHEMICAL DEVICES		5. TYPE OF REPORT & PERIOD COVERED Final 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Donald Campbell Donald O. Egner		8. CONTRACT OR GRANT NUMBER(s) LEAA-J-IAA-014-2
9. PERFORMING ORGANIZATION NAME AND ADDRESS U. S. Army Human Engineering Laboratory Aberdeen Proving Ground, Maryland 21005		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE January 1976 13. NUMBER OF PAGES 83
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Less-Lethal Devices
Chemical
Chemical Incapacitating Agents
Law Enforcement

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Models have been developed for evaluating chemical devices in the one-on-one and barricade-and-hostage types of law-enforcement scenarios. Thus, with the model developed under an earlier task for evaluating chemical devices in the crowd control-type scenario, models have now been developed for evaluating chemical devices in the three general types of law enforcement type-situations deemed amenable to the effective employment of chemical incapacitating agents.

The quantitative measures obtained for selected devices, tested under another task, have been used in these models to obtain estimates of sample performance levels of these devices when employed in applicable scenarios.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

MODELING FOR LESS-LETHAL CHEMICAL DEVICES

Donald Campbell
Donald O. Egner

January 1976

This project was supported by Interagency Agreement No. LEAA-J-IAA-014-2 between the Law Enforcement Assistance Administration and the U. S. Army Human Engineering Laboratory and awarded under the Omnibus Crime Control and Safe Streets Act of 1968, as amended. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the Department of Army or the U. S. Department of Justice.

APPROVED: _____
JOHN D. WEISZ
Director
U. S. Army Human Engineering Laboratory

U. S. ARMY HUMAN ENGINEERING LABORATORY
Aberdeen Proving Ground, Maryland 21005

Acknowledgements

Law Enforcement Assistance Administration
Richard W. Velde
Administrator

National Institute of Law Enforcement
and Criminal Justice
Gerald M. Caplan
Director

Office of Research Programs
Geoffrey Alprin
Director

Equipment Systems Improvement Division
Joseph T. Kochanski
Director

Less-Lethal Weapons Evaluation Program
Lester D. Shubin
Manager

This document was prepared by the Military and Civilian Law Enforcement Technology Team of the U. S. Army Human Engineering Laboratory. Technical research was performed by the authors of this report.

CONTENTS

EXECUTIVE SUMMARY

The standardized methodology developed for evaluating blunt-trauma-producing less-than-lethal weapons in law enforcement scenarios has been extended to include provisions for evaluating chemical weapons. Models have been developed for three general types of law-enforcement scenarios deemed amenable to the effective employment of chemical agents. One of these models, the modified-cloud-travel model, was proposed under a previous task and the other two were developed under this task. The three scenario types, and the applicable chemical model for each, are shown in Table 1 below.

TABLE 1

Types Of Scenarios Amenable To Chemical Agents' Employment And Applicable Evaluation Models

Scenario Type	Applicable Model
One-On-One	Projector
Barricade and Hostage	Ventilation
Crowd Dispersal	Modified Cloud Travel

In conjunction with, but not as part of this task, four series of tests were conducted to obtain quantitative measurements for use in these models. The quantitative measures obtained for selected items tested were used in the appropriate models to estimate sample performance levels of these devices when employed in applicable scenarios of current definition. A brief summary description of the nature of these tests is found in Appendix C.

MODELING FOR LESS-LETHAL CHEMICAL DEVICES

INTRODUCTION

The Military and Civilian Law Enforcement Technology Team of the U.S. Army Human Engineering Laboratory at Aberdeen Proving Ground, Maryland, has been working for the past several years under an agreement with the Law Enforcement Assistance Administration, on methods of assessing the effects of less-lethal weapons when employed in law-enforcement roles. A generalized evaluation technique for the evaluation of less-lethal weapons was formulated under Tasks 1 and 2 of this agreement and is described in a Draft Report (1). The general evaluation model presented in this referenced report was built around blunt-trauma type less-lethal weapons. Included among subsequent tasks under this agreement was a task concerned with the evaluation of chemical-incapacitating-agent dispersing systems in law-enforcement scenarios. As work on this first chemical task progressed, it became obvious that the development of one all-encompassing model for evaluating chemical munitions was not feasible but, rather, several models would be needed to cover the various device/operational use combinations. Nevertheless, a modified cloud-travel model was developed under this first chemical task for evaluating chemical weapons in a law-enforcement crowd dispersal role (2).

Subsequent to the above, two additional tasks on the evaluation of chemical agents were begun. These were:

1. "Modeling for Less-Lethal Chemical Devices", and

2. "Testing and Evaluation of Chemical Weapons".

Under 1, chemical modeling was extended to include the Projector Model and the Ventilation Model. With the addition of these two models, chemical-evaluation models have been developed for the three general types of law-enforcement scenarios deemed amenable to the effective employment of chemical incapacitating agents. The purpose of this report is to describe the chemical models developed under 1 above.

A desirable effect is achieved when a device accomplishes the purpose for which the law-enforcement officers used it. As indicated above, the desired effect will be different for each scenario type. For example, in the one-on-one scenario, the desirable effect is to give the officer at least 30 seconds to apply handcuffs; in the barricade and hostage scenario, it is desired to subdue the offender before he can harm the hostage, and keep him subdued from 2 to 5 minutes to allow the law-enforcement officers time to defeat the barricade, secure the offender, and rescue the hostage; and in the crowd-dispersal scenario, it is desired to motivate the crowd to move of its own accord within a brief period after utilization of the less-lethal weapon. While it is recognized that desirable effects will be achieved in many instances when no physical discomfort has been felt by the target personnel, these non-physiological effects have not been included in the illustrative examples of this study. Further behavior analysis work will be needed in this area before these desirable effects can be quantified for inclusion in the evaluation models.

In the area of undesirable effects, any of the following effects are considered undesirable:

1. Be lethal.

2. Cause serious or irreversible damage.

3. Provoke observers to join disturbance.

4. Cause discomfort or pain among observers.

5. Provoke retaliation by target personnel.

Thus it is seen, as in the case of desirable effects, that undesirable effects may be physiological and/or non-physiological. However, again as with desirable effects, efforts to quantify the non-physiological undesirable effects have been unsuccessful and, as a consequence, are not treated in this study.

The current definition of the undesirable physiological effect is "that anatomical and/or functional effect which persists longer than 24 hours and prevents an individual from performing routine daily tasks and/or produces permanent impairment as defined by the American Medical Association (AMA) ratings".

MODEL DEVELOPMENT

Projector Model

The hand-held, hand-actuated pressurized chemical-incapacitating-agent dispersers are small cylindrical containers, generally about 6-1/4 inches long and 1-3/8 inches in diameter, with a dispenser assembly on top. These units disperse their formulations as highly directional short-range (up to 10-15 feet) bursts of spray. A typical unit might deliver 40 one-second bursts, with about 2.5 grams of agent formulation being dispersed per burst. Thus, these devices provide the law enforcement officer with a useful alternative to the traditional nightstick. Their effectiveness, however, depends on the ability of the officer to aim their spray with sufficient accuracy to impact it in the orbital area of the offender. It seems obvious, then, in light of the foregoing discussion, that the applicability of these devices to law-enforcement situations is limited at present to the one-on-one type scenario.

In developing the model for evaluating the chemical-incapacitating-agent projectors, two postulates were made, viz.:

1. For desirable effects—incapacitation is immediate if the agent impacts in the orbital area, and

2. For undesirable effects—the probability of an undesirable effect is either 0 or 1.

There are several factors which may influence the probability of hitting the orbital area. Some of the more obvious of these are range to target, wind conditions, charge condition of container, and firing position of officer (whether he is firing from a "ready" or random position).

TABLE 2

Data Bank Of Desirable Effects, Aerosol Projectors—
Times To Hit Orbital Area, Seconds

SUBJECT	DEVICE	POSITION: READY, RANGE 3'	POSITION: READY, RANGE 10'	POSITION: RANDOM, RANGE 3'	POSITION: RANDOM, RANGE 10'
	Army Experimental Device	1.6	1.3	2.5	3.6
1	Paralyzer	.8	-	2.0	-
	Federal Streamer	.6	1.6	2.6	3.6
	Penguin Stinger	.9	1.9	2.7	3.3
	Army Experimental Device	.5	1.3	1.9	3.2
2	Paralyzer	.6	-	1.2	-
	Federal Streamer	.9	1.9	2.2	2.5
	Penguin Stinger	.9	5.1	2.2	-
	Army Experimental Device	1.0	2.0	2.2	3.0
3	Paralyzer	.9	-	2.0	-
	Federal Streamer	1.1	1.4	2.3	3.0
	Penguin Stinger	.9	2.0	2.4	4.0
	Army Experimental Device	.8	2.2	2.5	3.8
4	Paralyzer	.2	-	1.7	-
	Federal Streamer	.9	1.2	2.4	2.8
	Penguin Stinger	1.2	10+	2.6	10+

μ .86

σ .31

Since the scenario type applicable here (one-on-one type police scenario) has a time criterion for effectiveness, the probability of achieving a desirable effect will depend not only on whether the agent impacts in the orbital area but also when this impaction occurs (how quickly after the decision is made to use the device). Thus, the probability of achieving a desirable effect is the probability of hitting the orbital area within the time constraint imposed by the scenario definition. It follows, then, that a necessary first step in the development of a projector-evaluation model for general application will be the establishment of a data bank of times taken to hit the orbital area as a function of such parameters as range to target, wind conditions, charge condition of container, and firing position of officer. From this data base, probability-density functions may be fitted describing the probability of hitting the orbital area as a function of time constraint (i.e., probability of a desirable effect) for selected combinations of the operating conditions listed above.

Appendix C contains synoptic summary descriptions of the nature of some chemical-device testings conducted under a companion task of the Interagency Agreement under which the present task was performed. Some of the data from these tests, as well as some data collected under an earlier task of this Agreement, were used to exercise the three chemical models in their respective scenarios of applicability. However, many more test data will be needed to establish data bases sufficient for quantifying parameter values for general models applications.

A great deal has been written about the possible hazards associated with the use of chemical incapacitating agents, particularly the eye hazards. For example, the sources of information looked at during the course of this work included:

1. Technical reports from Edgewood Arsenal, Maryland, and from the Chemical Defense Establishment, England;

2. Technical articles in various scientific and medical journals; and

3. Non-technical articles in newspapers and magazines. Many of the newspaper and magazine articles describe accounts of law-enforcement officer(s) and/or member(s) of the press or public official(s) actually participating in mock demonstrations wherein they submit to being sprayed with the agent, to determine if there are any lasting ill effects. None of these voluntary subjects experienced more than transitory effects from the chemical sprayings.

The literature, even under conditions involving indiscriminate use or misuse of these agents, indicates the risk to be quite small and, in most instances, negligible in comparison with conventional weapons.

Undesirable effects resulting from the employment of small, hand-held pressurized-agent dispersers will be due primarily to physical damage to the orbital area. The extent of this damage will be a function of such factors as engagement range, type of agent, and possibly of elapsed time between agent contamination and medical attention. For engagement ranges less than two feet, physical damage may occur, and consequently for our model the probability of an undesirable effect at a range of two feet or less is assumed to be one.

Ventilation Model

When law-enforcement officers employ chemical-agent-filled grenades and projectiles against an individual who has barricaded himself in an enclosure, desirable effects are achieved when the

TABLE 3

Estimates Of Concentration Coverage-Time Of Cloud Envelopment For Bursting-Type Devices

Downwind Distance, x, from source, meters	Semi-width, y, of contour at downwind Distance, x, meters	Average normalized, Dosage, D/Q sec/m^3	Average normalized concentration. C/Q, $1/m^3$	Time of Envelopment by Contour, sec.	Area m^2
5	16	1.4×10^{-2}	2.8×10^{-3}	5	110
10	20	4.9×10^{-3}	7.2×10^{-4}	7	194
15	24	2.7×10^{-3}	3.2×10^{-4}	8	231
20	26	1.8×10^{-3}	1.8×10^{-4}	10	259
25	28	1.3×10^{-3}	1.2×10^{-4}	11	282
30	30	9.7×10^{-4}	8.2×10^{-5}	12	301
35	32	7.7×10^{-4}	6.0×10^{-5}	13	318
40	33	6.3×10^{-4}	4.6×10^{-5}	14	333
45	35	5.3×10^{-4}	3.7×10^{-5}	14	347
50	36	4.5×10^{-4}	3.0×10^{-5}	15	360
55	37	3.9×10^{-4}	2.5×10^{-5}	16	371
60	38	3.5×10^{-4}	2.1×10^{-5}	17	382
65	39	3.1×10^{-4}	1.8×10^{-5}	17	392
70	40	2.8×10^{-4}	1.5×10^{-5}	18	402
75	41	2.5×10^{-4}	1.3×10^{-5}	19	411
80	42	2.3×10^{-4}	1.2×10^{-5}	19	420
85	43	2.1×10^{-4}	1.0×10^{-5}	20	428
90	43	1.9×10^{-4}	9.2×10^{-6}	20	436
95	44	1.7×10^{-4}	8.3×10^{-6}	21	444
100	45	1.6×10^{-4}	7.5×10^{-6}	22	451
105	45	1.5×10^{-4}	6.8×10^{-6}	22	458
110	46	1.4×10^{-4}	6.2×10^{-6}	23	465

suspect is taken into custody without serious injury—to others or himself. Whether he voluntarily surrenders because of the intolerable discomfort of remaining in the enclosure or is sufficiently disoriented to permit law-enforcement officers to enter the enclosure and take him into custody is not important. However, there are potential hazards associated with employing chemical grenades and projectiles against barricaded individuals. There is the chance, though small, that lethal dosage levels may be obtained, particularly if the agent is CN. Hazards associated with kinetic-energy/blunt-trauma/fire may require consideration. Devices which disintegrate or shatter create potential hazards of injury from flying particles of metal or plastic. Burning-type disseminating devices constitute potential fire hazards. Errant rounds may cause serious injury by hitting personnel inside the enclosure. However, far more data than are presently available are needed before these potential hazards can be quantified sufficiently for inclusion in an effectiveness model to predict undesirable effects. Consequ tly, undesirable effects are not treated, except in the area of lethal dosage.

Once the chemical device is fired into an enclosure, the law-enforcement officer if faced with the problem of when to enter. The officer should wait until reasonably sure that the occupants are incapable of violent resistance, but he must not wait until the occupants receive fatal dosages. Depending upon the tactical doctrine employed, "reasonably sure" could mean 84 percent or greater probability of incapacitation. On the other hand, a 1 percent probability could perhaps be universally agreed upon by all law enforcement agencies as the maximum acceptable risk of lethality.

With this in mind an expression has been developed which relates the time to achieve a specified dosage with ventilation rate, volume of enclosure and the initial concentration (function of munition agent payload).

To wit:

Consider an amount of agent, Q, dispersed in a room or other enclosure of volume, V, with an air-exchange rate (fraction of volume replaced per unit time), R.

The differential equation describing the change in the amount of agent in the room with time may be expressed as

$$\frac{dQ}{dt} = -RQ \qquad (1)$$

Integrating and using the initial condition $Q = Q_o$ when $t = 0$, we get

$$Q = Q_o e^{-Rt} \qquad (2)$$

Since concentration, c, is Q/V, equation 2 may be written as

$$c = C_o e^{-Rt} \qquad (3)$$

The dosage, D, at the end of t units of time after time zero is

$$D = \int_0^t c \, d\lambda \qquad (4)$$

Introducing equation (3) into equation (4) and performing the indicated integration yields

$$D = \frac{C_o}{R}(1 - e^{-Rt}) \qquad (5)$$

Rearranging (5), the expression for the time to achieve a specified dosage is

$$t = -\frac{1}{R} \log_e (1 - RD/C_o) \qquad (6)$$

Substituting initial payload, Q_o, for initial concentration, C_o, equation (6) becomes

$$t = -\frac{1}{R} \log_e (1 - RDV/Q'_o) \qquad (7)$$

Where:

$$Q'_o = kQ_o$$

and k = efficiency factor for agent dissemination[1].

Modified-Cloud-Travel Model

As noted above, the modified-cloud-travel model, for evaluating chemical weapons in a crowd-dispersal role, was developed under a previous task of this Basic Agreement. For ease of reference, this model is included as Appendix B of this report.

As indicated in the model development, this model is applicable to instantaneous point sources, i.e., bursting-type devices. For burning-type devices, the following modifications and/or changes in terminology or interpretations need be made:

1. Normalized dosage (mg-min/cu m) in the equations for bursting devices becomes concentration (mg/cu m) in the equations for burning devices; consequently, wherever the symbol D appears, substitute the symbol C.

2. Whereas the source strength, Q (in mg), for bursting-type devices is obtained by multiplying the amount of agent fill (in mg) by disseminating efficiency factor, the source strength (in mg/sec) for a burning-type device is the amount of agent disseminated per second and is obtained by multiplying the amount of agent fill (in mg) by disseminating efficiency factor,and dividing by agent emission time (in sec).

3. The time (in sec) that a position will be enveloped by the concentration will be increased for burning-type devices by an amount of time equal to the agent-dissemination time.

4. Equation (14B) will not be needed for burning-type devices since average concentration (in mg/cu m) for these devices will be obtained with equation (13B).

At the risk of including too much detail, the following step-by-step procedure for applying the modified-cloud-travel-model is presented in an attempt to avoid any confusion:

1. Assume a contour center position downwind along the mean wind track or x-axis (i.e., y=o) at a distance Xc from source initiation point.

---

[1] Agent-dissemination efficiency factors have not been determined for many of the chemical-agent dispersing devices, and tests should be conducted to determine them. However, based on both conversations with individuals who have had considerable experience with methods of chemical-agent dissemination and the results of the previously referenced tests conducted under this agreement, agent-dissemination efficiency factors of 0.1 and 0.5 are suggested for use for bursting and burning-type devices, respectively, until they can be more accurately determined.

2. Select parameters from Table 4 for prevailing atmospheric stability conditions.

3. Select device to be employed—multiply amount of agent fill by efficiency factor for agent dissemination to obtain source strength for bursting-type device; if device is burning-type, divide this product by agent-emission time to obtain source strength.

4. Compute extent of contour along mean wind track by using equation (7B) of Appendix B; however, if the results of using equation (7B) are negative when the negative sign is used, i.e., if $Xc<3\sigma_y(X_c/X_1)^{\alpha}$, compute contour length by the expression

$$L = Xc+3\sigma_y (X_c/X_1)^{\alpha}$$

5. Use equation (9B) of Appendix B to compute the exposure duration time (time that a point along the mean wind track will be enveloped by the cloud). The time thus computed is the exposure-duration-time estimate for a bursting device; to obtain the exposure-duration-time estimate for burning devices, add agent-emission time to the time computed by equation (9B).

6. Compute maximum downwind extent, Xm, of contour with equation (10B) of Appendix B.

7. Use equation (1B) of Appendix B to calculate, at the downwind position (Xm,0), (a) normalized dosage, D/Q, for bursting device, or (b) normalized concentration, C/Q, for burning device.

8. Use equation (2B) of Appendix B to calculate, at downwind distance, Xc; the semi-width, y, of the contour enclosing the normalized dosage or higher (or normalized concentration or higher if burning device) calculated in step 7.

9. Use equation (12B) of Appendix B to calculate, at downwind distance, Xc, (a) crosswind integrated normalized dosage for bursting device or (b) crosswind integrated normalized concentration for burning device.

10. Use equation (13B) of Appendix B to calculate, (a) average normalized dosage, $\bar{D}/Q$, for bursting device or (b) average normalized concentration, $\bar{C}/Q$, for burning device.

11. Compute average normalized concentration, $\bar{C}/Q$, for bursting device with equation (14B) of Appendix B.

12. Calculate average concentration by multiplying source strength by average normalized concentration.

13. Use exposure time calculated in step 5 with average concentration determined in step 12 with appropriate curves of Appendix A (Figure 1A for Agent CS and Figure 2A for CN) to estimate response probability.

14. The area enclosing the average concentration contour may be approximated by any one of several numerical integrating techniques. The range of integration along the mean wind track or x-axis will be $Xc\pm 3\sigma_y(X_c/X_1)^{\alpha}$; i.e., equation (7B) of Appendix B, if $Xc\geq 3\sigma_y(X_c/X_1)^{\alpha}$; however, if $Xc<3\sigma_y(X_c/X_1)^{\alpha}$, the range of integration along this axis will be from 0 to $Xc+3\sigma_y(X_c/X_1)^{\alpha}$. The crosswind extent of the contour for selected distances within this range may be determined by using the normalized dosage (or normalized concentration) value found in step 7 above in equation (2B) of Appendix B.

TABLE 4

Parameter Values for Cloud Travel in Urban Areas(3)

Condition	α	β	$\sigma_{y,m.}$	$\sigma_{z,m}$	u, m/sec.
Poor	0.50	1.344	41.19	25.17	2.1
Average	0.50	1.091	30.99	5.45	8.6
Good	0.50	0.755	31.18	5.57	1.6

Looking at the tolerance time-response-concentration curves of Figure 1A of Appendix A for Agent CS, it may be seen that these curves do not extend below 30 seconds response times. It seems reasonable to assume, however, that if concentration is increased, a level will be reached that will become intolerable in less than 30 seconds. Consequently, work needs to be done to extend the curves of Figure 1A to include response times of less than 30 seconds.

SAMPLE ASSESSMENTS

The following examples will serve to illustrate the methods by which the two models for chemical munitions developed under this task, and the model developed under an earlier task, may be applied to obtain indexes of effectiveness for the selected chemical munitions when employed in their respective scenarios of applicability.

Projector Model/One-On-One Police Scenario

Background

A common tactical situation in which chemical less-lethal weaponry might be employed by a police officer is in the arrest of an individual for some type of misdemeanor. Ordinarily the offender offers no resistance, but occasionally the officer must use force in making the arrest. Most likely the encounter will involve an adult male or a physically mature teenager and will occur on the street and, hence, out in the open. Moreover, it seems likely that the encounter may be precipitated by a short chase and subsequent "shake down" of the apparent offender. In this case the distance between the officer and the offender might be arms length. The unarmed offender might push or shove the officer, attempt to jerk away from him or strike him. Optimum effectiveness would be achieved in this scenario if the officer were able to keep the offender from becoming aggressive or to dissuade him from continued aggressive action, while at the same time permitting him sufficient mobility to walk to the call box or cruiser. Specifically, the offender needs to be sufficiently disoriented to allow the officer at least 30 seconds to apply handcuffs, and this disorientation should occur in a reasonably short period of time—say one second or less.

Assumptions

A misdemeanor has been committed by a physically mature teenager and has resulted in a confrontation with a law-enforcement officer. The officer, an older man and of slender build, has opted for a display of meaning business by having a chemical aerosol projector in a "ready" position. The approximate distance between the officer and the offender is three feet. The unarmed offender attempts to escape by pushing and brushing by the officer. The officer fires the aerosol projector.

Numerical Analysis

In this scenario the desirable effect is to disorient the offender for about 30 seconds, as this is a time duration which has been determined through practice to be sufficient for a law-enforcement officer to apply handcuffs. Moreover, because of the urgency to subdue the offender quickly, we would like the onset of the disorientation to occur within one second. In the projector model we postulate that the effects of the chemical agent in the aerosol projectors are instantaneous if the spray pattern falls upon the orbital area.

Some tests have been conducted with various chemical aerosol projectors at different ranges under two firing states--ready and random. In these tests the time to hit the orbital area has been measured for four different aerosol projectors (see Table 2). Unfortunately, the sample size for each projector is small. If we postulate, however, that there is not any difference between the average "hit times" for each of these projectors at a three-foot range, then the probability of a desirable effect in one second may be determined byassuming that the sample for the four projectors tested at three feet is from a normally distributed population of all hit times from all projectors that might be used in a one-on-one situation, and obtain an estimate of the mean impact time, μ, and standard deviation, σ. Then, by computing the probability of hitting the orbital area in one second or less we find the probability of a desirable effect in this scenario under the assumed conditions, i.e.,

$\mu = .86$ sec

From Table 2

$\sigma = .31$ sec

Therefore, prob effect = $P(T \leq 1)$

Where T is time to hit orbital area in seconds. Transforming to the normalized form we get,

$$z = \frac{T-\mu}{\sigma} = \frac{1-0.86}{0.31} = 0.45.$$

Thus, from a table of the cumulative normal distribution we find, $P(T \leq 1) = 0.674$ = probability that the orbital area will be hit in one second or less = probability of a desirable effect.

Although this sample computation combines data for all projectors, data for the specific type of projector being evaluated would normally be used if data had been gathered on that device.

In considering undesirable effects, the possibility of obtaining a lethal dose of agent from an aerosol projector would appear to be remote. Considering the relatively small amount of agent which is dispensed per burst, it would probably be impossible to operate the dispenser fast enough to produce a lethal concentration. However, as noted above, undesirable effects can result if the device is improperly used at ranges less than two feet and with no post-exposure first aid, such as flushing the exposed body area with water. For our example we will assume the law officer will use the projector properly, and that the projector itself is of reliable design and construction so that there will be no undesirable effects (P_u=o).

Ventilation Model/Barricade and Hostage

Background

A recurring problem which confronts police forces is provided by those offenders who have committed a serious crime and who barricade themselves inside a building. The problem is compounded if the offender is holding a hostage. In the latter circumstance it is mandatory to subdue the offender before the hostage is harmed. Usually the distance between the offender and the police is on the order of 10-50 meters. Unfortunately, there is no line-of-sight technique for attacking the offender; because of fear of being shot, he will be careful not to expose himself at windows or doors without a hostage shield. Therefore, under these circumstances the chemical less-lethal weapon must either penetrate or circumvent the obstacles which protect the offender from line-of-sight attacks. If the control forces opt for the use of chemical weapons in this situation the problem of when to enter surfaces.

Assumptions

An offender has barricaded himself with a hostage in an interior room on the third floor of an older hotel. The construction is typically masonry with one window fronting on the street. The room size is 10'x15'x8', and the ventilation rate conforms to that required by code (hotels are required by code to exchange the air in a room four times per hour or provide 25-30 cf/m exchange per person, whichever is the larger). However, it seems likely that the air conditioning system would be turned off during an encounter such as this, and thus the ventilation would be significantly reduced to that afforded by natural leakage around windows and doors. A value of 10 cf/m is assumed to be realistic for our case here. It has been decided to employ a barricade-penetrating projectile filled with a solution containing 55 grams of agent CN. The agent-dissemination-efficiency factor is approximately[2] 0.10. As noted above, in this type of situation, the law-enforcement officers want to be reasonably sure the the offender is incapable of violent resistance before they enter the room. On the other hand, they do not want to wait so long before entry that those inside will have received near-lethal dosages of agent. The concentration needed for an 84 percent probability of incapacitation in one minute is 182 mg/cu m(4) (also see Figure 2A), and the concentration expected to give a one percent probability of lethality in one minute is 600 mg/cu m (see Appendix D). Thus the assumed ICt 84 and LCt 1 dosage values are 182 mg-min/cu m and 600 mg-min/cu m, respectively.

---

[2]The filling weight and agent-dissemination efficiency used are consistant with measured values obtained from tests conducted under another task of this agreement.

Numerical Analysis

Formula (7) of the ventilation model gives time to achieve a specified dosage, D, as a function of fraction of air in room or enclosure exchanged per unit of time, R; volume of room or enclosure, V; amount of agent disseminated, Q_o, and agent-dissemination-efficiency factor, k; viz.,

$$t = \frac{-1}{R} \log_e (1-RDV/kQ_o)$$

Summarizing our assumptions stated above:

$$R = \frac{10 \text{ cf/m}}{(10')(15')(8')} = 0.00833/\text{min}$$

D = 182 mg-min/cu m for 84% probability of incapacitation
600 mg-min/cu m for 1% probability of lethality

V = (10') (15')(8') = 1200 cu ft = 33.98 cu m

Q_o = 55000 mg

k = 0.1

Using these assumed parameter values in the above equation (equation (7) of the ventilation model), we get:

t = 1.13 min = 68 sec to achieve ICt 84
3.8 min to achieve LCt 1

Thus, based upon concentrations achieved, the officers want to wait at least 68 seconds after firing the round before entering the room but they do not want to wait longer than 3.8 minutes.

The ventilation model has been further exercised to make estimates using the concentrations obtained with the devices used in test series 2 and 3. These results are shown in Table 2D of Appendix D. Also included in Appendix D as Tables 3D through 50D, are theoretical time-guidance estimates obtained by applying the ventilation model for many of the CS and CN agent-dispersing devices presently available to law-enforcement personnel for the barricade-and-hostage situation. A negative one time estimate indicates that the assumed airborne agent is not expected to produce the indicated dosage.

Crowd Dispersal/Modified-Cloud-Travel Model

Background

Frequently it is necessary for police forces of various sizes to cope with crowds of people intent on blocking a public road, street or park. The size of such a crowd might vary from 100 to 1000 or more and will be composed of men and women. The desired effect of a less-lethal weapon for this application is for it to motivate the crowd to move on its own accord. The time between utilizing such a weapon and the onset of its effect should be relatively brief, though the effect need not be instantaneous.

Assumptions

It is assumed that preliminary measures such as talk (bull horn, etc.) have been used by the control forces. The fraction of the crowd that remains is at least moderately motivated (allows use of Edgewood Arsenal's human-tolerance estimates for CS(5) (see also Appendix A). Furthermore, it is assumed that the munition functions with probability one and is placed at a nominal distance of 85 meters from the crowd.

Numerical Analysis

A time limit of five minutes has been set for clearing the area(1). Therefore, the effectiveness index need only be examined over this 5 minute = 300-seconds interval.

In this analysis, the modified-cloud-travel model outlined in Appendix B was used to compute estimates of expected concentration/coverage time of cloud envelopment as a function of distance downwind from the source, employing parameter values for cloud travel over urban terrain under average atmospheric-stability conditions[3] (see Table 4). These estimates were in turn used with the concentration-time response curves, Figure 1A, to determine the effectiveness estimates.

For example:

From Table 3 (Extracted from Reference 5)

Downwind distance from source - 85 meters

Average normalized concentration - $2.1 \times 10^{-4} m^{-3}$

Time of envelopment -20 sec

Area of Cloud [3] $-428\ m^2$

Assume contents of three CS grenades is 450 grams (150 grams each).

$$\text{concentration} = 2.1 \times 10^{-4} \times 450 = 95 \ \frac{mg}{m^3}$$

If one can extrapolate the curves of Figure 1A, it is seen that a CS agent concentration of 95 mg/m^3 is intolerable to 84 percent of the men in a 20-second exposure. Thus, $P_{DE} = .84$.

This example is admittedly oversimplified—it does not include some of the more important probabilities for desirable effects such as those due to reaction to the visual cloud signature, nor does it include delivery error and, consequently, the chance that all or part of the contour will miss the crowd. Some preliminary accuracy-of-device tests were conducted under a previous task of this Agreement.(2)

[3] Assumed much smaller than crowd size and completely within crowd for this analysis.

CONCLUSIONS AND RECOMMENDATIONS

1. Models were developed and exercised for evaluating chemical-dispersing devices in two law-enforcement-type scenarios. With the development of these two models, chemical-evaluation models have now been developed for the three general types of law-enforcement scenarios deemed amenable to the effective employment of chemical agents, viz.,

   a. One-on-One

   b. Barricade and Hostage

   c. Crowd Dispersal

2. For general-models applications, considerable testing of chemical devices will be required to establish data bases for quantifying parameters used in the chemical-evaluation models, e.g., such parameters as delivery accuracy and agent-payload-dissemination efficiency.

3. The three basic chemical evaluation models require further refinement for prediction of results, although for comparative purposes they may suffice.

REFERENCES

1. Egner, D. O., Shank, E. B., Wargovich, M. J., & Tiedemann, A. F., Jr. A multidisciplinary technique for the evaluation of less-than-lethal weapons (Volume I). Draft Report, July 1973.

2. Egner, D. O., Campbell, D., Shank, E. B., & Tiedemann, A F., Jr. The effectiveness of less-lethal weapons utilizing chemical agents. Draft Report, May 1974.

3. Calder, K. L. Mathematical models for dosage and casualty coverage resulting from single point and line source releases of aerosol near ground level. Biological Warfare Laboratory Technical Study No. 3, Fort Detrick, MD, December 1957.

4. McNamara, B. P., Vocci, F. J., & Owens, E. J. The toxicology of CN. Edgewood Arsenal Technical Report 4207, Aberdeen Proving Ground, MD, December 1968.

5. Research Laboratories, Edgewood Arsenal. Human estimates committee minutes, Inclosure 4. Aberdeen Proving Ground, MD, 4 December 1969.

6. McNamara, B. P., Owens, E. J., Weimer, J. T., Balard, J. A., & Vocci, F. J. Toxicology of riot control chemicals CS, CN, and DM. Edgewood Arsenal Technical Report 4309, Aberdeen Proving Ground, MD, November 1969.

7. Milly, G. H. Atmospheric diffusion and generalized munitions expenditures. U. S. Army Chemical Corps Operations Research Group Study No. 17, Edgewood Arsenal, MD.

APPENDIX A

CHEMICAL-AGENT EFFECTIVENESS DATA

Figure 1A shows the Edgewood Arsenal's Human Estimates Committee estimates for human tolerance to CS aerosols, based on moderately motivated young male subjects over a concentration range of 0.5 to 28.0 mg/cu m.(5) It may be seen from this figure that the concentration which will incapacitate (become intolerable to) 50 percent of a population of moderately motivated men in one minute is 7 mg/cu m.

Figure 2A shows the human tolerance to airborne CN(4). However, the test subjects used in obtaining this data were probably not as highly motivated as the CS test subjects.

Inhalation ICt 50's, LCt 50's, and safety factors (LCt50/ICt50) determined at Edgewood Arsenal, Maryland, for CS and CN for indicated dispersion systems are listed in the following table(6):

TABLE 1A

Estimated ICt 50's, LCt 50's and Safety Factors (LCt50/ICt50)
for CS and CN Disseminated Using the Indicated Dispersion Systems

Agent	Dispersion System	ICt 50 mg min/cu m	LCt 50 mg min/cu m	Safety Factor LCt50/ICt50
CS	Molten dispersion	0.1 - 10.0	52,000	5,200 - 520,000
	M7A3 grenade		61,000	6,100 - 610,000
CN	Laboratory dispersion	20-213	7,000	33 - 350
	Commercial grenade		14,000	65 - 700

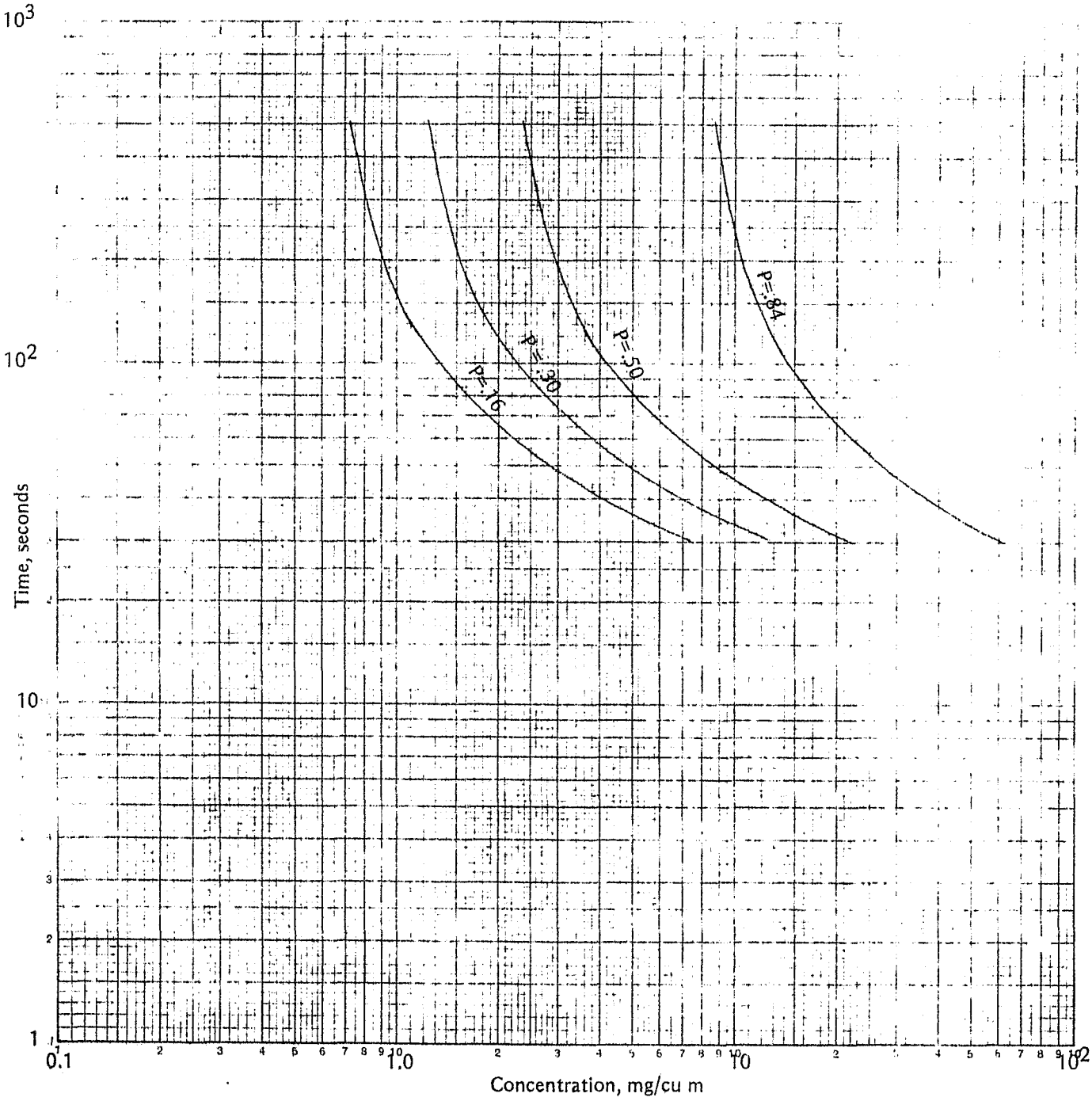

Fig. 1A. Human tolerance estimates for CS aerosols.

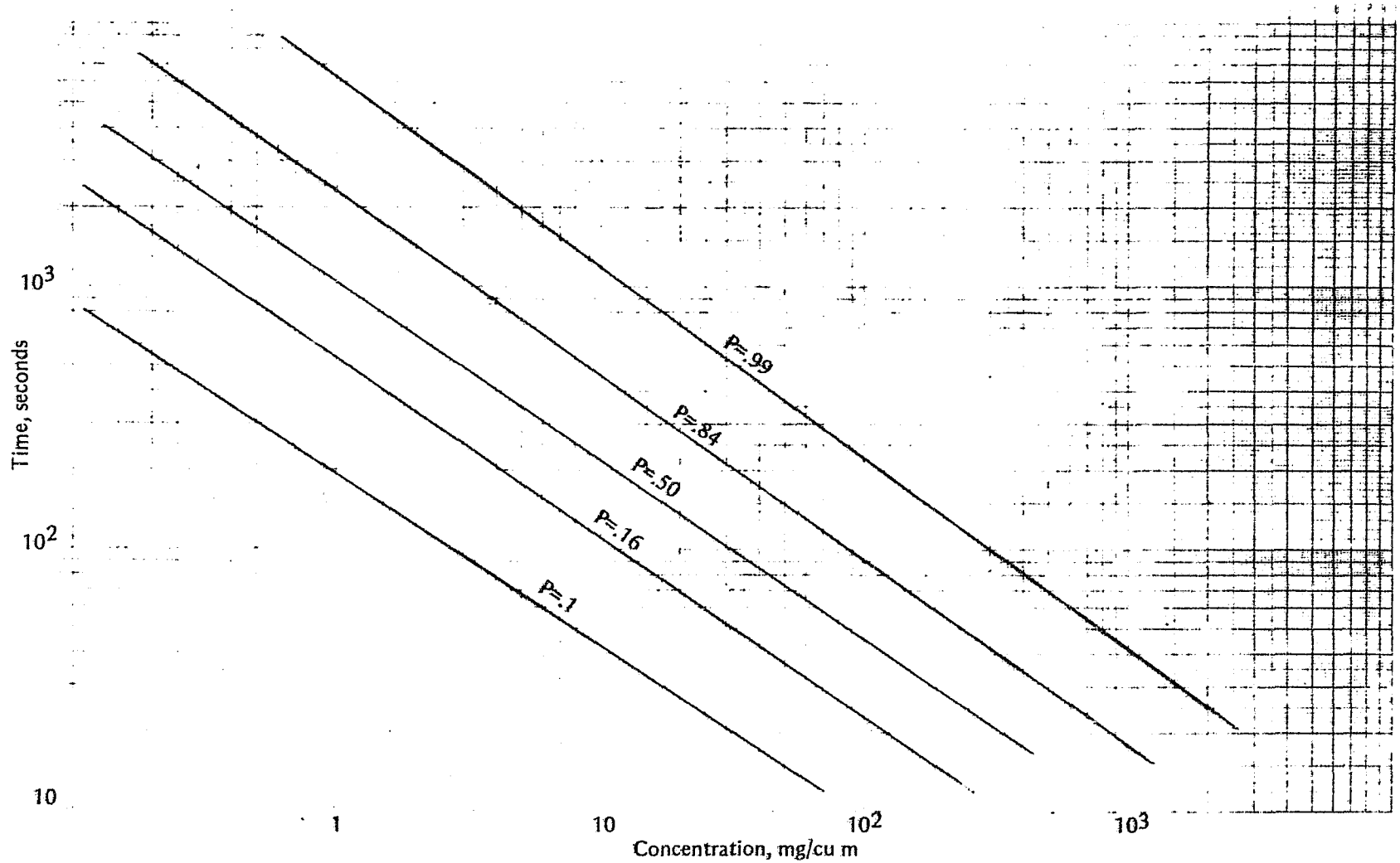

Fig. 2A. Human tolerance estimates for agent CN (at various P levels of response).

APPENDIX B

CLOUD-TRAVEL MODEL(2)

For those chemical agents that are inhaled, and the retained quantity is accumulated within the body until the accumulation is sufficient to provide a biological effect such as death or vomiting, agent effectiveness is generally expressed in terms of dosage, i.e., the product of the airborne concentration (C, in weight/unit volume) and the exposure time (t). The terms LCt50 and ICt50 refer respectively to dosages which are lethal (L) and incapacitating (I) to 50 percent of the exposed population. In dealing with irritating agents, however, the term ICt50 has a somewhat special connotation—the higher the concentration, the shorter the exposure time men will tolerate. The term ICt50 for the irritating agents usually means that concentration which will become intolerable to 50 percent of the exposed population within one minute. Thus, the effectiveness of irritants is described by a combination of airborne concentration, tolerance time, and percent of exposed population response.

In order to obtain estimates of concentration-time relationships for use in evaluating chemical munitions filled with the irritating agents CN and CS, it was necessary to modify some of the existing cloud-travel models. The procedure for accomplishing this is outlined below.

The following expression was derived by G.H. Milly(7) for predicting normalized total dosage downwind over smooth terrain from an instantaneous point source of vapor or inhalable particles, disseminated and sampled at ground level:

$$\frac{D}{Q}(x,y,o) = \frac{1}{\pi\sigma_y\sigma_z\bar{u}(x/x_1)^{\alpha+\beta}} \exp \frac{-y^2}{2\sigma_y^2(x/x_1)^{2\alpha}} \qquad (1B)$$

where: D = total dosage, mg-min/cu m

Q = source strength, mg = amount of agent fill times dissemination-efficiency factor

σ_y, σ_z = lateral and vertical standard deivations of cloud mass at x distance downwind from source, m

α, β = nondimensional atmospheric-stability parameters

$\bar{u}$ = mean wind speed, m/sec

x = downwind distancefrom source, m

v = crosswind distan ce from mean wind track or x-axis, m

x_1 = 100 meters

By rearranging equation (1), Milly's expression for the semi-width of a contour of normalized dosage, D/Q, at x distance downwind from the source is obtained.

$$y = \left\{ 2\sigma_y^2(x/x_1)^{2\alpha} \log_e \frac{1}{\pi\sigma_y\sigma_z\bar{u}\frac{D}{Q}(x,y,o)(x/x_1)^{\alpha+\beta}} \right\}^{1/2} \qquad (2B)$$

Inherent in the derivations of the Milly equations are the assumptions that the space mean concentration in the cloud is normally distributed about each of its axes and that the standard deviations are simple power functions of the distance traveled. Milly proposed the following expressions to relate standard deviations to downwind distance:

$$\sigma_x = \sigma_x[x_1]\ (x/x_1)^{\gamma}$$

$$\sigma_y = \sigma_y\ [x_1]\ (x/x_1)^{\alpha} \qquad (3B)$$

$$\sigma_z = \sigma_z\ [x_1]\ (x/x_1)^{\beta}$$

The additional assumption was made by Milly that the speed of the downwind movement of the agent-cloud center is equal to the mean wind speed. Thus, the downwind distance, x_c, of the cloud center at a finite time, t, after emission is given by:

$$x_c = \bar{u}t. \qquad (4B)$$

Consequently, an estimate of the cloud dimensions, as the cloud moves downwind, can be obtained by using equations (2), (3) and (4).

The extent of the cloud along the mean wind track is:

$$x_c \pm 3\sigma_x (x_c/x_1)^{\gamma} \qquad (5B)$$

and the cloud length, L, is:

$$L = 6\sigma_x (x_c/x_1)^{\gamma} \qquad (6B)$$

Efforts to empirically relate the parameter γ to atmospheric stability have not been satisfactory. Hence, for practical applications, the practice has been to assume equivalence for the parameters γ and α and, consequently, equivalence for the standard deviations σ_x and σ_y. Hence, equations (5) and (6) become, respectively,

$$x_c \pm 3\sigma_y (x_c/x_1)^{\alpha} \qquad (7B)$$

$$L = 6\sigma_y (x_c/x_1)^{\alpha} \qquad (8B)$$

Assuming the cloud moves downwind at the rate of the mean wind speed, the time, t, that a point along the mean wind track will be enveloped by the cloud is obtained by dividing the cloud length by the mean wind speed:

$$t = L/\bar{u}. \qquad (9B)$$

It is both intuitively obvious and can be seen from equation (1) that the normalized dosage decreases with increasing downwind distance, and hence the minimum normalized dosage along the mean wind track occurs at the maximum downwind extent of the cloud, viz., at:

$$x = x_c + 3\sigma_y (x_c/x_1)^{\alpha} \qquad (10B)$$

Using this value of x, and y = 0, in equation (1) enables the determination of the normalized dosage at this maximum downwind distance. This normalized dosage can in turn be used in equation (2) to determine the semi-width of the contour as a function of downwind distance

The crosswind integrated normalized dosage, CWID/Q at x distance downwind from the source is:

$$CWID/Q = 2 \int_0^y \frac{D}{Q}(x,y,o,)dy. \qquad (11B)$$

Introducing equation (1) into (11) and integrating yields:

$$CWID/Q = \frac{\sqrt{2\pi}}{\pi\sigma_z \bar{u}(x/x_1)^{\beta}} \quad \text{erf} \quad \left[\frac{\sqrt{2}\,y}{2\sigma_y (x/x_1)^{\alpha}}\right] \qquad (12B)$$

where

$$\text{erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-\lambda 2} d\lambda$$

The average normalized dosage, $\bar{D}/Q$, at a given distance downwind is obtained by dividing the normalized crosswind integrated dosage at that distance by the cloud width at that distance.

$$\bar{D}/Q = CWID/2y \qquad (13B)$$

The average normalized concentration, $\bar{C}/Q$, is obtained by dividing the average normalized dosage by time of cloud envelopment,

$$\bar{C}/Q = \bar{D}/QT \qquad (14B)$$

Thus, with the above-modified cloud-travel model, values may be determined for use with concentration-time response curves, to estimate the effectiveness of irritating-agent-dispensing devices employed under selected atmospheric stability conditions.

APPENDIX C

SUMMARY OF TESTS WITH CHEMICAL DEVICES TO OBTAIN AGENT DATA FOR USE IN THE CHEMICAL-EVALUATION MODELS

Four series of chemical-device tests were conducted under a companion task of the Interagency Agreement between the Law Enforcement Assistance Administration (LEAA) and the U.S. Army Human Engineering Laboratory (USAHEL). A brief summary of the nature of each series is presented in this Appenidx.

The first series of tests was conducted in the Environmental Toxicology Branch's wind tunnel at Edgewood Arsenal to obtain the amount of agent deposited per three-second burst on a target, and also the amount of vapor emanating from the area of deposition from the employment of each of three selected hand-held, hand-actuated, pressurized riot-control-agent dispersing devices. The second and third series of tests were conducted at the H.P. White Laboratory, Bel Air, Maryland, to measure the concentrations produced by the devices being tested. Agents were dispersed inside a sealed 8' x 8' x 8' box-type enclosure constructed of one-half-inch-thick plywood. Series-two tests were conducted using four types of barricade-penetrating devices; and in series-three tests, four types of hand-held hand-actuated, pressurized riot-control-agent dispersing devices were used. The fourth series of tests was conducted at the U.S. Army Human Engineering Laboratory test site, at Aberdeen Proving Ground, Maryland, to obtain estimates of the times taken to hit the orbital area with four types of hand-held, hand actuated, pressurized dispersers. The results of these tests are presented in a separate report according to the basic LEAA/USAHEL Agreement. The task title under which these are found is "Testing and Evaluation of Chemical Weapons".

APPENDIX D

PROCEDURE FOR OBTAINING ESTIMATES OF RESPONSE TIMES FOR 84 PERCENT PROBABILITY OF INCAPACITATION AND 1 PERCENT PROBABILITY OF LETHALITY FOR THE AVERAGE CONCENTRATIONS PRODUCED BY CHEMICAL-INCAPACITATING-AGENT DISPERSING DEVICES

Procedure

The incapacitating-time estimates were obtained directly from curves (4, 5) depicting probability of incapacitation as a function of exposure time and agent concentration. Regarding lethal-time estimates, however, curves depicting probability of lethality as a function of exposure time and concentration are not available, but instead we are given Lct 50 (the product of concentration and exposure time expected to be lethal to 50 percent of those exposed) values(6). Consequently, estimates were necessary to arrive at Lct 1 (the product of concentration and exposure time expected to be lethal to 1 percent of those exposed) values. To accomplish this, the assumption was made that the following relationship holds:

$$\frac{\text{Lct 50}}{\text{Ict 50}} = \frac{\text{Lct 1}}{\text{Ict 1}} \qquad (1)$$

where Ict 1 and ICT 50 are the products of concentration and exposure time expected to incapacitate, respectively, 1 percent and 50 percent of those exposed. The incapacitating-exposure time assumed for the Ict's,used in estimating Lct 1's, was 1 minute.

No Ict 1 curve was included in the tolerance-time concentration curves for agent CS; consequently, for CS, an estimated Ict 1 value of 0.5 mg-min/ cu m was obtained by extrapolating from a cross plot, on log-probability paper, of concentration versus probability of incapacitation for 1-minute exposure. This extrapolation procedure is believed to be valid because: (a) the points from which the extrapolation was made essentially plotted as a straight line on log-probability paper; and (b) the same procedure applied to agent CN gave an Ict 1 estimate which differed from the actual value by less than 20 percent.

The method of using Lct 50 and Ict 1 and Ict 50 values to estimate Lct 1 values,along with the Lct 1 values found for agents CS and CN, follow:

CS

Lct 50 = 52,000 to 61,000 mg-min/cu m(6)

Ict 50 (for 1 minute exposure) = 6.9 mg-min/cu m(5)

Ict 1 (extrapolated from cross plot, 1 minute exposure) = 0.5 mg-min/cu m

Introducting these values into equation 1, we find -

Lct 1 = 3,768 to 4,420 mg-min/cu m

In the interest of safety in estimating the time to achieve Lct 1, we choose the lower value. Rounded to the nearest hundred, we get 3800 mg-min/cu m.

CN

Lct 50 = 7000 to 14,000 mg-min/cu m(6)

Ict 50 = 69.3 mg-min/cu m(4)

Ict 1 = 5.9 mg-min/cu m (4)

Introducing these values into equation 1, we find -

Lct 1 = 596 to 1192 mg-min/cu m

As in the case of CS, in the interest of safety in estimating the time to achieve Lct 1, we choose the lower value. Rounded to the nearest hundred, we get 600 mg-min/cu m.

A word is in order regarding the choice of 1-minute exposure time in selecting the Ict values for use in approximating Lct 1's. The reason for this choice is that, unless time is specified, incapacitating dosage generally refers to that concentration which will be intolerable to a specified percentage of those exposed within 1 minute. If Ict values corresponding to shorter exposure times had been used, larger Lct 1 values would have resulted, while Ict values corresponding to longer exposure times would have indicated smaller Lct 1 values. The following tabulated values illustrate this:

CS

	Exposure time, sec	Lct 1, mg-min/cu m
	30	4630 to 5432
	45	4180 to 4904
	60	3768 to 4420
	75	3335 to 3913
	90	3314 to 3888
Average	60	3845 to 4511

CN

	30	609 to 1219
	45	599 to 1198
	60	596 to 1192
	75	592 to 1183
	90	573 to 1145
Average	60	594 to 1187

Since Lct is concentration integrated over time, for a given concentration, time estimates to achieve Lct 1 will vary inversely with the exposure time used to select the Ict values for approximating Lct's. Consequently, safety considerations would preclude using the extremely short exposure times.

In summary, the Lct 1 values found by the above procedure and the Ict 84 values obtained from the curves of references 3 and 4 are shown in the Table below.

TABLE 1D

Lct 1 and Ict 84 Values For Agents CS and CN

Agent	Lct 1 mg-min/cu m	Ict 84 mg-min/cu m
CS	3,800	22
CN	600	182

Time estimates, obtained with the ventilation model, for achieving the applicable dosage values of Table 1D for the devices and enclosure of test series 2 and 3 are shown in Table 2D.

Further applications of the ventilation model, using the applicable dosage values from Table 1D, have been made to evaluate many of the presently available CS and CN agent-dispersing devices designed for use in barricade-and-hostage situations. For these computations, dissemination efficiency factors of 0.5 and 0.1 were used for the burning-type-agent ejection devices and the bursting-type-agent-ejection-devices, respectively. As noted earlier, these dissemination-efficiency factors were arrived at from the results of our chemical device tests in enclosures and through conversations with individuals who have been working in the field of evaluating chemical devices. Results of these applications of the ventilation model are shown in Tables 3D through 50D.

TABLE 2D

Times To Achieve Ict 84 and Lct 1 Values For
Average Concentrations Observed During Chemical
Test Series Numbers 2 And 3
Building Size - 8' x 8' x 8'

Device	Agent	Based On First 5 Minute Concentrations			Based on Second 5 Minute Concentrations		
		Average Conc. mg/cu m	Time To Achieve Ict 84 Sec.	Lct 1 Min.	Average Conc. mg/cu m	Time To Achieve Ict 84 Sec.	Lct 1 Min.
12 Ga. S&W Truflite Mark II	CS	31	45	123	7	-	543
AAI Ferret SGA 100	CS	22	59	173	9	420	422
Federal 514 Grenade	CS	275	11	14	77	23	49
Federal Flite Rite 530	CS	252	11	15	231	12	16
Chemical Mace Mark IV	CN	4	873	150	4	873	150
Federal Streamer 280	CN	5	747	120	4	873	150
Penguin Chemical Billy AG-20	CN	2	1,420	300	2	1,420	300
DPC Paralyzer	CS	1	2,309	600	0	-	-

TABLE 3D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 1
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	15.5	0.9
MPG-100	AAI CORPORATION	9.50	22.9	1.3
SKITTER 6001	BRUNSWICK CORP	8.00	27.2	1.5
109 POCKET	FEDERAL LABS	10.00	21.8	1.2
112 SPEDEHEAT	FEDERAL LABS	62.00	3.5	0.2
119 HAN-BALL	FEDERAL LABS	17.50	12.4	0.7
120 DISINTEGRATING	FEDERAL LABS	15.30	14.2	0.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	14.2	0.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	3.4	0.2
MODEL 34	LAKE ERIE CHEM CO	6.00	36.3	2.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	20.5	1.1
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	24.9	1.4
CN/SMOKE	PENGUIN INDUSTRIES	34.50	6.3	0.3
BASEBALL	PENGUIN INDUSTRIES	2.00	110.1	6.3
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	29.8	1.7
206 SPEDEHEAT	FEDERAL LABS	21.00	10.3	0.6
219 SPEDEHEAT	FEDERAL LABS	21.00	10.3	0.6
230 FLITE RITE	FEDERAL LABS	21.00	10.3	0.6
232 FLITE RITE	FEDERAL LABS	5.50	39.6	2.2
233 BLAST DISPERS.	FEDERAL LABS	5.50	39.6	2.2
234 BLAST DISPERS.	FEDERAL LABS	5.50	39.6	2.2
265 SKAT SHELL	FEDERAL LABS	26.00	8.4	0.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	38.2	2.1
TRU-FLITE	LAKE ERIE CHEM CO	4.50	48.5	2.7
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	22.4	1.2
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	806.9	65.1

TABLE 4D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 2
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	15.6	0.9
MPG-100	AAI CORPORATION	9.50	23.0	1.3
SKITTER 6001	BRUNSWICK CORP	8.00	27.3	1.5
109 POCKET	FEDERAL LABS	10.00	21.8	1.2
112 SPEDEHEAT	FEDERAL LABS	62.00	3.5	0.2
119 HAN-BALL	FEDERAL LABS	17.50	12.4	0.7
120 DISINTEGRATING	FEDERAL LABS	15.30	14.2	0.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	14.2	0.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	3.4	0.2
MODEL 34	LAKE ERIE CHEM CO	6.00	36.5	2.1
MOB MASTER	LAKE ERIE CHEM CO	10.60	20.6	1.1
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	25.0	1.4
CN/SMOKE	PENGUIN INDUSTRIES	34.50	6.3	0.3
BASEBALL	PENGUIN INDUSTRIES	2.00	111.8	6.6
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	30.0	1.7
206 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
219 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
230 FLITE RITE	FEDERAL LABS	21.00	10.4	0.6
232 FLITE RITE	FEDERAL LABS	5.50	39.9	2.2
233 BLAST DISPERS.	FEDERAL LABS	5.50	39.9	2.2
234 BLAST DISPERS.	FEDERAL LABS	5.50	39.9	2.2
265 SKAT SHELL	FEDERAL LABS	26.00	8.4	0.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	38.5	2.2
TRU-FLITE	LAKE ERIE CHEM CO	4.50	48.8	2.8
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	22.5	1.3
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	924.3	-1.0

TABLE 5D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 3
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	15.6	0.9
MPG-100	AAI CORPORATION	9.50	23.0	1.3
SKITTER 6001	BRUNSWICK CORP	8.00	27.4	1.5
109 POCKET	FEDERAL LABS	10.00	21.9	1.2
112 SPEDEHEAT	FEDERAL LABS	62.00	3.5	0.2
119 HAN-BALL	FEDERAL LABS	17.50	12.5	0.7
120 DISINTEGRATING	FEDERAL LABS	15.30	14.3	0.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	14.3	0.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	3.4	0.2
MODEL 34	LAKE ERIE CHEM CO	6.00	36.7	2.1
MOB MASTER	LAKE ERIE CHEM CO	10.60	20.6	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	25.0	1.4
CN/SMOKE	PENGUIN INDUSTRIES	34.50	6.3	0.3
BASEBALL	PENGUIN INDUSTRIES	2.00	113.6	7.1
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	30.1	1.7
206 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
219 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
230 FLITE RITE	FEDERAL LABS	21.00	10.4	0.6
232 FLITE RITE	FEDERAL LABS	5.50	40.1	2.3
233 BLAST DISPERS.	FEDERAL LABS	5.50	40.1	2.3
234 BLAST DISPERS.	FEDERAL LABS	5.50	40.1	2.3
265 SKAT SHELL	FEDERAL LABS	26.00	8.4	0.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	38.7	2.2
TRU-FLITE	LAKE ERIE CHEM CO	4.50	49.2	2.8
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	22.6	1.3
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	1106.7	-1.0

TABLE 6D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 4
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	15.6	0.9
MPG-100	AAI CORPORATION	9.50	23.1	1.3
SKITTER 6001	BRUNSWICK CORP	8.00	27.5	1.6
109 POCKET	FEDERAL LABS	10.00	22.0	1.2
112 SPEDEHEAT	FEDERAL LABS	62.00	3.5	0.2
119 HAN-BALL	FEDERAL LABS	17.50	12.5	0.7
120 DISINTEGRATING	FEDERAL LABS	15.30	14.3	0.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	14.3	0.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	3.4	0.2
MODEL 34	LAKE ERIE CHEM CO	6.00	36.9	2.1
MOB MASTER	LAKE ERIE CHEM CO	10.60	20.7	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	25.1	1.4
CN/SMOKE	PENGUIN INDUSTRIES	34.50	6.3	0.3
BASEBALL	PENGUIN INDUSTRIES	2.00	115.5	7.6
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	30.2	1.7
206 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
219 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
230 FLITE RITE	FEDERAL LABS	21.00	10.4	0.6
232 FLITE RITE	FEDERAL LABS	5.50	40.3	2.3
233 BLAST DISPERS.	FEDERAL LABS	5.50	40.3	2.3
234 BLAST DISPERS.	FEDERAL LABS	5.50	40.3	2.3
265 SKAT SHELL	FEDERAL LABS	26.00	8.4	0.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	38.9	2.3
TRU-FLITE	LAKE ERIE CHEM CO	4.50	49.5	2.9
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	22.6	1.3
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	1462.9	-1.0

TABLE 7D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 5
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	15.7	0.9
MPG-100	AAI CORPORATION	9.50	23.2	1.3
SKITTER 6001	BRUNSWICK CORP	8.00	27.6	1.6
109 POCKET	FEDERAL LABS	10.00	22.0	1.3
112 SPEDEHEAT	FEDERAL LABS	62.00	3.5	0.2
119 HAN-BALL	FEDERAL LABS	17.50	12.5	0.7
120 DISINTEGRATING	FEDERAL LABS	15.30	14.3	0.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	14.3	0.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	3.4	0.2
MODEL 34	LAKE ERIE CHEM CO	6.00	37.1	2.2
MOB MASTER	LAKE ERIE CHEM CO	10.60	20.8	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	25.2	1.4
CN/SMOKE	PENGUIN INDUSTRIES	34.50	6.3	0.4
BASEBALL	PENGUIN INDUSTRIES	2.00	117.5	8.2
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	30.3	1.8
206 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
219 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
230 FLITE RITE	FEDERAL LABS	21.00	10.4	0.6
232 FLITE RITE	FEDERAL LABS	5.50	40.5	2.4
233 BLAST DISPERS.	FEDERAL LABS	5.50	40.5	2.4
234 BLAST DISPERS.	FEDERAL LABS	5.50	40.5	2.4
265 SKAT SHELL	FEDERAL LABS	26.00	8.4	0.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	39.1	2.3
TRU-FLITE	LAKE ERIE CHEM CO	4.50	49.9	3.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	22.7	1.3
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 8D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 6
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	15.7	0.9
MPG-100	AAI CORPORATION	9.50	23.3	1.3
SKITTER 6001	BRUNSWICK CORP	8.00	27.7	1.6
109 POCKET	FEDERAL LABS	10.00	22.1	1.3
112 SPEDEHEAT	FEDERAL LABS	62.00	3.5	0.2
119 HAN-BALL	FEDERAL LABS	17.50	12.5	0.7
120 DISINTEGRATING	FEDERAL LABS	15.30	14.3	0.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	14.3	0.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	3.4	0.2
MODEL 34	LAKE ERIE CHEM CO	6.00	37.3	2.2
MOB MASTER	LAKE ERIE CHEM CO	10.60	20.8	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	25.3	1.5
CN/SMOKE	PENGUIN INDUSTRIES	34.50	6.3	0.4
BASEBALL	PENGUIN INDUSTRIES	2.00	119.6	9.1
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	30.5	1.8
206 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
219 SPEDEHEAT	FEDERAL LABS	21.00	10.4	0.6
230 FLITE RITE	FEDERAL LABS	21.00	10.4	0.6
232 FLITE RITE	FEDERAL LABS	5.50	40.8	2.4
233 BLAST DISPERS.	FEDERAL LABS	5.50	40.8	2.4
234 BLAST DISPERS.	FEDERAL LABS	5.50	40.8	2.4
265 SKAT SHELL	FEDERAL LABS	26.00	8.4	0.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	39.3	2.3
TRU-FLITE	LAKE ERIE CHEM CO	4.50	50.2	3.1
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	22.8	1.3
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 9D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 1
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	31.9	1.8
MPG-100	AAI CORPORATION	9.50	47.2	2.6
SKITTER 6001	BRUNSWICK CORP	8.00	56.1	3.1
109 POCKET	FEDERAL LABS	10.00	44.8	2.5
112 SPEDEHEAT	FEDERAL LABS	62.00	7.2	0.4
119 HAN-BALL	FEDERAL LABS	17.50	25.5	1.4
120 DISINTEGRATING	FEDERAL LABS	15.30	29.2	1.6
121 BLAST DISPERS.	FEDERAL LABS	15.30	29.2	1.6
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	7.0	0.4
MODEL 34	LAKE ERIE CHEM CO	6.00	75.0	4.2
MOB MASTER	LAKE ERIE CHEM CO	10.60	42.3	2.4
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	51.3	2.9
CN/SMOKE	PENGUIN INDUSTRIES	34.50	12.9	0.7
BASEBALL	PENGUIN INDUSTRIES	2.00	229.8	13.7
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	61.5	3.4
206 SPEDEHEAT	FEDERAL LABS	21.00	21.3	1.2
219 SPEDEHEAT	FEDERAL LABS	21.00	21.3	1.2
230 FLITE RITE	FEDERAL LABS	21.00	21.3	1.2
232 FLITE RITE	FEDERAL LABS	5.50	81.9	4.6
233 BLAST DISPERS.	FEDERAL LABS	5.50	81.9	4.6
234 BLAST DISPERS.	FEDERAL LABS	5.50	81.9	4.6
265 SKAT SHELL	FEDERAL LABS	26.00	17.2	0.9
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	79.0	4.5
TRU-FLITE	LAKE ERIE CHEM CO	4.50	100.3	5.7
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	46.2	2.6
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	1913.5	-1.0

TABLE 10D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 2
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	32.1	1.8
MPG-100	AAI CORPORATION	9.50	47.5	2.7
SKITTER 6001	BRUNSWICK CORP	8.00	56.5	3.2
109 POCKET	FEDERAL LABS	10.00	45.1	2.6
112 SPEDEHEAT	FEDERAL LABS	62.00	7.2	0.4
119 HAN-BALL	FEDERAL LABS	17.50	25.6	1.4
120 DISINTEGRATING	FEDERAL LABS	15.30	29.3	1.6
121 BLAST DISPERS.	FEDERAL LABS	15.30	29.3	1.6
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	7.0	0.4
MODEL 34	LAKE ERIE CHEM CO	6.00	75.8	4.4
MOB MASTER	LAKE ERIE CHEM CO	10.60	42.5	2.4
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	51.6	2.9
CN/SMOKE	PENGUIN INDUSTRIES	34.50	13.0	0.7
BASEBALL	PENGUIN INDUSTRIES	2.00	237.7	15.7
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	62.1	3.6
206 SPEDEHEAT	FEDERAL LABS	21.00	21.3	1.2
219 SPEDEHEAT	FEDERAL LABS	21.00	21.3	1.2
230 FLITE RITE	FEDERAL LABS	21.00	21.3	1.2
232 FLITE RITE	FEDERAL LABS	5.50	82.8	4.8
233 BLAST DISPERS.	FEDERAL LABS	5.50	82.8	4.8
234 BLAST DISPERS.	FEDERAL LABS	5.50	82.8	4.8
265 SKAT SHELL	FEDERAL LABS	26.00	17.2	1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	79.9	4.6
TRU-FLITE	LAKE ERIE CHEM CO	4.50	101.8	6.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	46.5	2.6
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	3133.1	-1.0

TABLE 11D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 3
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	32.2	1.8
MPG-100	AAI CORPORATION	9.50	47.8	2.8
SKITTER 6001	BRUNSWICK CORP	8.00	57.0	3.3
109 POCKET	FEDERAL LABS	10.00	45.4	2.6
112 SPEDEHEAT	FEDERAL LABS	62.00	7.2	0.4
119 HAN-BALL	FEDERAL LABS	17.50	25.7	1.4
120 DISINTEGRATING	FEDERAL LABS	15.30	29.5	1.7
121 BLAST DISPERS.	FEDERAL LABS	15.30	29.5	1.7
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	7.0	0.4
MODEL 34	LAKE ERIE CHEM CO	6.00	76.6	4.6
MOB MASTER	LAKE ERIE CHEM CO	10.60	42.8	2.5
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	52.0	3.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	13.0	0.7
BASEBALL	PENGUIN INDUSTRIES	2.00	246.3	18.9
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	62.6	3.7
206 SPEDEHEAT	FEDERAL LABS	21.00	21.4	1.2
219 SPEDEHEAT	FEDERAL LABS	21.00	21.4	1.2
230 FLITE RITE	FEDERAL LABS	21.00	21.4	1.2
232 FLITE RITE	FEDERAL LABS	5.50	83.8	5.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	83.8	5.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	83.8	5.0
265 SKAT SHELL	FEDERAL LABS	26.00	17.2	1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	80.8	4.8
TRU-FLITE	LAKE ERIE CHEM CO	4.50	103.3	6.3
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	46.8	2.7
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 12D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 4
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	32.4	1.9
MPG-100	AAI CORPORATION	9.50	48.1	2.8
SKITTER 6001	BRUNSWICK CORP	3.00	57.5	3.4
109 POCKET	FEDERAL LABS	10.00	45.7	2.7
112 SPEDEHEAT	FEDERAL LABS	62.00	7.2	0.4
119 HAN-BALL	FEDERAL LABS	17.50	25.8	1.5
120 DISINTEGRATING	FEDERAL LABS	15.30	29.6	1.7
121 BLAST DISPERS.	FEDERAL LABS	15.30	29.6	1.7
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	7.0	0.4
MODEL 34	LAKE ERIE CHEM CO	6.00	77.5	4.8
MOB MASTER	LAKE ERIE CHEM CO	10.60	43.0	2.5
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	52.4	3.1
CN/SMOKE	PENGUIN INDUSTRIES	34.50	13.0	0.7
BASEBALL	PENGUIN INDUSTRIES	2.00	255.8	25.4
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	63.2	3.8
206 SPEDEHEAT	FEDERAL LABS	21.00	21.5	1.2
219 SPEDEHEAT	FEDERAL LABS	21.00	21.5	1.2
230 FLITE RITE	FEDERAL LABS	21.00	21.5	1.2
232 FLITE RITE	FEDERAL LABS	5.50	84.8	5.3
233 BLAST DISPERS.	FEDERAL LABS	5.50	84.8	5.3
234 BLAST DISPERS.	FEDERAL LABS	5.50	84.8	5.3
265 SKAT SHELL	FEDERAL LABS	26.00	17.3	1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	81.7	5.1
TRU-FLITE	LAKE ERIE CHEM CO	4.50	104.8	6.8
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	47.1	2.8
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 13D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 5
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	32.5	1.9
MPG-100	AAI CORPORATION	9.50	48.5	2.9
SKITTER 6001	BRUNSWICK CORP	8.00	57.9	3.5
109 POCKET	FEDERAL LABS	10.00	46.0	2.7
112 SPEDEHEAT	FEDERAL LABS	62.00	7.2	0.4
119 HAN-BALL	FEDERAL LABS	17.50	25.9	1.5
120 DISINTEGRATING	FEDERAL LABS	15.30	29.7	1.7
121 BLAST DISPERS.	FEDERAL LABS	15.30	29.7	1.7
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	7.0	0.4
MODEL 34	LAKE ERIE CHEM CO	6.00	78.3	5.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	43.3	2.6
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	52.8	3.2
CN/SMOKE	PENGUIN INDUSTRIES	34.50	13.0	0.7
BASEBALL	PENGUIN INDUSTRIES	2.00	266.4	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	63.7	3.9
206 SPEDEHEAT	FEDERAL LABS	21.00	21.5	1.2
219 SPEDEHEAT	FEDERAL LABS	21.00	21.5	1.2
230 FLITE RITE	FEDERAL LABS	21.00	21.5	1.2
232 FLITE RITE	FEDERAL LABS	5.50	85.9	5.6
233 BLAST DISPERS.	FEDERAL LABS	5.50	85.9	5.6
234 BLAST DISPERS.	FEDERAL LABS	5.50	85.9	5.6
265 SKAT SHELL	FEDERAL LABS	26.00	17.3	1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	82.7	5.3
TRU-FLITE	LAKE ERIE CHEM CO	4.50	106.4	7.2
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	47.4	2.8
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 14D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 6
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	32.7	1.9
MPG-100	AAI CORPORATION	9.50	48.8	3.0
SKITTER 6001	BRUNSWICK CORP	8.00	58.4	3.7
109 POCKET	FEDERAL LABS	10.00	45.3	2.8
112 SPEDEHEAT	FEDERAL LABS	62.00	7.2	0.4
119 HAN-BALL	FEDERAL LABS	17.50	26.0	1.5
120 DISINTEGRATING	FEDERAL LABS	15.30	29.8	1.7
121 BLAST DISPERS.	FEDERAL LABS	15.30	29.8	1.7
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	7.0	0.4
MODEL 34	LAKE ERIE CHEM CO	6.00	79.2	5.2
MOB MASTER	LAKE ERIE CHEM CO	10.60	43.6	2.6
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	53.2	3.3
CN/SMOKE	PENGUIN INDUSTRIES	34.50	13.0	0.7
BASEBALL	PENGUIN INDUSTRIES	2.00	278.2	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	64.3	4.1
206 SPEDEHEAT	FEDERAL LABS	21.00	21.6	1.2
219 SPEDEHEAT	FEDERAL LABS	21.00	21.6	1.2
230 FLITE RITE	FEDERAL LABS	21.00	21.6	1.2
232 FLITE RITE	FEDERAL LABS	5.50	87.0	5.9
233 BLAST DISPERS.	FEDERAL LABS	5.50	87.0	5.9
234 BLAST DISPERS.	FEDERAL LABS	5.50	87.0	5.9
265 SKAT SHELL	FEDERAL LABS	26.00	17.4	1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	83.7	5.6
TRU-FLITE	LAKE ERIE CHEM CO	4.50	108.1	7.8
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	47.8	2.9
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 15D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 1
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	89.5	5.1
MPG-100	AAI CORPORATION	9.50	132.6	7.6
SKITTER 6001	BRUNSWICK CORP	8.00	158.0	9.2
109 POCKET	FEDERAL LABS	10.00	125.9	7.2
112 SPEDEHEAT	FEDERAL LABS	62.00	20.0	1.1
119 HAN-BALL	FEDERAL LABS	17.50	71.4	4.0
120 DISINTEGRATING	FEDERAL LABS	15.30	81.8	4.6
121 BLAST DISPERS.	FEDERAL LABS	15.30	81.8	4.6
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	19.4	1.1
MODEL 34	LAKE ERIE CHEM CO	6.00	212.3	12.6
MOB MASTER	LAKE ERIE CHEM CO	10.60	118.6	6.8
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	144.2	8.3
CN/SMOKE	PENGUIN INDUSTRIES	34.50	36.0	2.0
BASEBALL	PENGUIN INDUSTRIES	2.00	678.6	50.1
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	173.6	10.1
206 SPEDEHEAT	FEDERAL LABS	21.00	59.4	3.3
219 SPEDEHEAT	FEDERAL LABS	21.00	59.4	3.3
230 FLITE RITE	FEDERAL LABS	21.00	59.4	3.3
232 FLITE RITE	FEDERAL LABS	5.50	232.2	13.8
233 BLAST DISPERS.	FEDERAL LABS	5.50	232.2	13.8
234 BLAST DISPERS.	FEDERAL LABS	5.50	232.2	13.8
265 SKAT SHELL	FEDERAL LABS	26.00	47.9	2.7
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	223.8	13.3
TRU-FLITE	LAKE ERIE CHEM CO	4.50	285.9	17.4
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	129.8	7.5
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 16D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 2
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	90.6	5.3
MPG-100	AAI CORPORATION	9.50	135.1	8.2
SKITTER 6001	BRUNSWICK CORP	8.00	161.7	10.0
109 POCKET	FEDERAL LABS	10.00	128.1	7.7
112 SPEDEHEAT	FEDERAL LABS	62.00	20.1	1.1
119 HAN-BALL	FEDERAL LABS	17.50	72.1	4.2
120 DISINTEGRATING	FEDERAL LABS	15.30	82.7	4.8
121 BLAST DISPERS.	FEDERAL LABS	15.30	82.7	4.8
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	19.4	1.1
MODEL 34	LAKE ERIE CHEM CO	6.00	218.9	14.2
MOB MASTER	LAKE ERIE CHEM CO	10.60	120.6	7.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	147.2	9.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	36.2	2.0
BASEBALL	PENGUIN INDUSTRIES	2.00	757.7	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	177.9	11.1
206 SPEDEHEAT	FEDERAL LABS	21.00	59.9	3.4
219 SPEDEHEAT	FEDERAL LABS	21.00	59.9	3.4
230 FLITE RITE	FEDERAL LABS	21.00	59.9	3.4
232 FLITE RITE	FEDERAL LABS	5.50	240.2	15.9
233 BLAST DISPERS.	FEDERAL LABS	5.50	240.2	15.9
234 BLAST DISPERS.	FEDERAL LABS	5.50	240.2	15.9
265 SKAT SHELL	FEDERAL LABS	26.00	48.2	2.7
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	231.2	15.2
TRU-FLITE	LAKE ERIE CHEM CO	4.50	298.3	21.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	132.3	8.0
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 17D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 3
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	91.8	5.6
MPG-100	AAI CORPORATION	9.50	137.8	8.9
SKITTER 6001	BRUNSWICK CORP	8.00	165.5	11.1
109 POCKET	FEDERAL LABS	10.00	130.5	8.3
112 SPEDEHEAT	FEDERAL LABS	62.00	20.1	1.1
119 HAN-BALL	FEDERAL LABS	17.50	72.8	4.3
120 DISINTEGRATING	FEDERAL LABS	15.30	83.7	5.0
121 BLAST DISPERS.	FEDERAL LABS	15.30	83.7	5.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	19.5	1.1
MODEL 34	LAKE ERIE CHEM CO	6.00	226.2	16.7
MOB MASTER	LAKE ERIE CHEM CO	10.60	122.8	7.7
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	150.4	9.8
CN/SMOKE	PENGUIN INDUSTRIES	34.50	36.4	2.1
BASEBALL	PENGUIN INDUSTRIES	2.00	869.2	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	182.7	12.5
206 SPEDEHEAT	FEDERAL LABS	21.00	60.4	3.5
219 SPEDEHEAT	FEDERAL LABS	21.00	60.4	3.5
230 FLITE RITE	FEDERAL LABS	21.00	60.4	3.5
232 FLITE RITE	FEDERAL LABS	5.50	249.0	19.2
233 BLAST DISPERS.	FEDERAL LABS	5.50	249.0	19.2
234 BLAST DISPERS.	FEDERAL LABS	5.50	249.0	19.2
265 SKAT SHELL	FEDERAL LABS	26.00	48.5	2.8
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	239.4	18.1
TRU-FLITE	LAKE ERIE CHEM CO	4.50	312.2	28.1
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	134.8	8.6
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 18D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 4
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	93.0	5.9
MPG-100	AAI CORPORATION	9.50	140.6	9.7
SKITTER 6001	BRUNSWICK CORP	8.00	169.6	12.5
109 POCKET	FEDERAL LABS	10.00	133.1	9.1
112 SPEDEHEAT	FEDERAL LABS	62.00	20.2	1.1
119 HAN-BALL	FEDERAL LABS	17.50	73.6	4.5
120 DISINTEGRATING	FEDERAL LABS	15.30	84.7	5.3
121 BLAST DISPERS.	FEDERAL LABS	15.30	84.7	5.3
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	19.5	1.1
MODEL 34	LAKE ERIE CHEM CO	6.00	234.1	21.1
MOB MASTER	LAKE ERIE CHEM CO	10.60	125.0	8.4
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	153.8	10.9
CN/SMOKE	PENGUIN INDUSTRIES	34.50	36.6	2.1
BASEBALL	PENGUIN INDUSTRIES	2.00	1045.8	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	187.7	14.5
206 SPEDEHEAT	FEDERAL LABS	21.00	60.9	3.6
219 SPEDEHEAT	FEDERAL LABS	21.00	60.9	3.6
230 FLITE RITE	FEDERAL LABS	21.00	60.9	3.6
232 FLITE RITE	FEDERAL LABS	5.50	258.8	26.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	258.8	26.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	258.8	26.0
265 SKAT SHELL	FEDERAL LABS	26.00	48.9	2.9
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	248.3	23.8
TRU-FLITE	LAKE ERIE CHEM CO	4.50	328.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	137.5	9.4
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 19D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 5
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	94.3	6.2
MPG-100	AAI CORPORATION	9.50	143.6	10.9
SKITTER 6001	BRUNSWICK CORP	8.00	174.0	14.8
109 POCKET	FEDERAL LABS	10.00	135.7	10.0
112 SPEDEHEAT	FEDERAL LABS	62.00	20.2	1.1
119 HAN-BALL	FEDERAL LABS	17.50	74.4	4.7
120 DISINTEGRATING	FEDERAL LABS	15.30	85.8	5.5
121 BLAST DISPERS.	FEDERAL LABS	15.30	85.8	5.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	19.6	1.1
MODEL 34	LAKE ERIE CHEM CO	6.00	242.9	34.6
MOB MASTER	LAKE ERIE CHEM CO	10.60	127.3	9.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	157.4	12.5
CN/SMOKE	PENGUIN INDUSTRIES	34.50	36.8	2.2
BASEBALL	PENGUIN INDUSTRIES	2.00	1410.2	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	193.2	17.9
206 SPEDEHEAT	FEDERAL LABS	21.00	61.4	3.8
219 SPEDEHEAT	FEDERAL LABS	21.00	61.4	3.8
230 FLITE RITE	FEDERAL LABS	21.00	61.4	3.8
232 FLITE RITE	FEDERAL LABS	5.50	269.6	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	269.6	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	269.6	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	49.2	2.9
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	258.2	60.6
TRU-FLITE	LAKE ERIE CHEM CO	4.50	346.2	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	140.3	10.5
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 20D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 6
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	95.6	6.6
MPG-100	AAI CORPORATION	9.50	146.8	12.6
SKITTER 6001	BRUNSWICK CORP	8.00	178.8	18.9
109 POCKET	FEDERAL LABS	10.00	138.5	11.4
112 SPEDEHEAT	FEDERAL LABS	62.00	20.3	1.2
119 HAN-BALL	FEDERAL LABS	17.50	75.2	4.9
120 DISINTEGRATING	FEDERAL LABS	15.30	86.8	5.9
121 BLAST DISPERS.	FEDERAL LABS	15.30	86.8	5.9
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	19.6	1.1
MODEL 34	LAKE ERIE CHEM CO	6.00	252.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	129.8	10.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	161.2	15.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	37.0	2.2
BASEBALL	PENGUIN INDUSTRIES	2.00	-1.0	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	199.1	26.7
206 SPEDEHEAT	FEDERAL LABS	21.00	62.0	3.9
219 SPEDEHEAT	FEDERAL LABS	21.00	62.0	3.9
230 FLITE RITE	FEDERAL LABS	21.00	62.0	3.9
232 FLITE RITE	FEDERAL LABS	5.50	281.8	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	281.8	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	281.8	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	49.6	3.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	269.3	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	367.6	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	143.4	12.1
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 21D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 1
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	372.0	23.5
MPG-100	AAI CORPORATION	9.50	562.5	38.9
SKITTER 6001	BRUNSWICK CORP	8.00	678.6	50.1
109 POCKET	FEDERAL LABS	10.00	532.2	36.2
112 SPEDEHEAT	FEDERAL LABS	62.00	80.7	4.6
119 HAN-BALL	FEDERAL LABS	17.50	294.4	18.0
120 DISINTEGRATING	FEDERAL LABS	15.30	338.8	21.1
121 BLAST DISPERS.	FEDERAL LABS	15.30	338.8	21.1
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	78.1	4.4
MODEL 34	LAKE ERIE CHEM CO	6.00	936.5	84.4
MOB MASTER	LAKE ERIE CHEM CO	10.60	499.9	33.5
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	615.1	43.8
CN/SMOKE	PENGUIN INDUSTRIES	34.50	146.3	8.4
BASEBALL	PENGUIN INDUSTRIES	2.00	4183.4	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	750.9	58.2
206 SPEDEHEAT	FEDERAL LABS	21.00	243.7	14.6
219 SPEDEHEAT	FEDERAL LABS	21.00	243.7	14.6
230 FLITE RITE	FEDERAL LABS	21.00	243.7	14.6
232 FLITE RITE	FEDERAL LABS	5.50	1035.1	104.2
233 BLAST DISPERS.	FEDERAL LABS	5.50	1035.1	104.2
234 BLAST DISPERS.	FEDERAL LABS	5.50	1035.1	104.2
265 SKAT SHELL	FEDERAL LABS	26.00	195.5	11.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	993.2	95.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	1311.9	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	550.0	37.8
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 22D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 2
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	393.4	31.3
MPG-100	AAI CORPORATION	9.50	614.8	92.3
SKITTER 6001	BRUNSWICK CORP	8.00	757.7	-1.0
109 POCKET	FEDERAL LABS	10.00	578.5	71.0
112 SPEDEHEAT	FEDERAL LABS	62.00	81.6	4.7
119 HAN-BALL	FEDERAL LABS	17.50	307.6	21.9
120 DISINTEGRATING	FEDERAL LABS	15.30	356.4	26.9
121 BLAST DISPERS.	FEDERAL LABS	15.30	356.4	26.9
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	79.0	4.6
MODEL 34	LAKE ERIE CHEM CO	6.00	1102.8	-1.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	540.3	57.9
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	678.7	-1.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	149.4	9.1
BASEBALL	PENGUIN INDUSTRIES	2.00	-1.0	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	850.4	-1.0
206 SPEDEHEAT	FEDERAL LABS	21.00	252.5	16.9
219 SPEDEHEAT	FEDERAL LABS	21.00	252.5	16.9
230 FLITE RITE	FEDERAL LABS	21.00	252.5	16.9
232 FLITE RITE	FEDERAL LABS	5.50	1246.8	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	1246.8	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	1246.8	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	201.1	12.9
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	1184.7	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	1698.6	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	599.7	81.6
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 23D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 3
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	418.6	70.7
MPG-100	AAI CORPORATION	9.50	683.0	-1.0
SKITTER 6001	BRUNSWICK CORP	8.00	869.2	-1.0
109 POCKET	FEDERAL LABS	10.00	637.8	-1.0
112 SPEDEHEAT	FEDERAL LABS	62.00	82.6	4.9
119 HAN-BALL	FEDERAL LABS	17.50	322.4	30.0
120 DISINTEGRATING	FEDERAL LABS	15.30	376.8	43.9
121 BLAST DISPERS.	FEDERAL LABS	15.30	376.8	43.9
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	79.9	4.8
MODEL 34	LAKE ERIE CHEM CO	6.00	1394.5	-1.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	591.1	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	764.6	-1.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	152.7	10.0
BASEBALL	PENGUIN INDUSTRIES	2.00	-1.0	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	998.3	-1.0
206 SPEDEHEAT	FEDERAL LABS	21.00	262.3	20.8
219 SPEDEHEAT	FEDERAL LABS	21.00	262.3	20.8
230 FLITE RITE	FEDERAL LABS	21.00	262.3	20.8
232 FLITE RITE	FEDERAL LABS	5.50	1661.8	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	1661.8	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	1661.8	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	207.2	14.8
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	1541.9	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	2975.3	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	664.2	-1.0
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 24D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 4
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	448.8	-1.0
MPG-100	AAI CORPORATION	9.50	777.9	-1.0
SKITTER 6001	BRUNSWICK CORP	8.00	1045.8	-1.0
109 POCKET	FEDERAL LABS	10.00	718.1	-1.0
112 SPEDEHEAT	FEDERAL LABS	62.00	83.6	5.2
119 HAN-BALL	FEDERAL LABS	17.50	339.4	-1.0
120 DISINTEGRATING	FEDERAL LABS	15.30	400.7	-1.0
121 BLAST DISPERS.	FEDERAL LABS	15.30	400.7	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	80.8	5.0
MODEL 34	LAKE ERIE CHEM CO	6.00	2231.5	-1.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	658.0	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	890.6	-1.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	156.2	11.2
BASEBALL	PENGUIN INDUSTRIES	2.00	-1.0	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	1258.7	-1.0
206 SPEDEHEAT	FEDERAL LABS	21.00	273.2	29.8
219 SPEDEHEAT	FEDERAL LABS	21.00	273.2	29.8
230 FLITE RITE	FEDERAL LABS	21.00	273.2	29.8
232 FLITE RITE	FEDERAL LABS	5.50	6838.9	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	6838.9	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	6838.9	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	213.8	17.9
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	3002.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	-1.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	752.7	-1.0
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 25D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 5
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	486.0	-1.0
MPG-100	AAI CORPORATION	9.50	925.1	-1.0
SKITTER 6001	BRUNSWICK CORP	8.00	1410.2	-1.0
109 POCKET	FEDERAL LABS	10.00	836.7	-1.0
112 SPEDEHEAT	FEDERAL LABS	62.00	84.6	5.5
119 HAN-BALL	FEDERAL LABS	17.50	359.0	-1.0
120 DISINTEGRATING	FEDERAL LABS	15.30	429.3	-1.0
121 BLAST DISPERS.	FEDERAL LABS	15.30	429.3	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	81.8	5.2
MODEL 34	LAKE ERIE CHEM CO	6.00	-1.0	-1.0
MOB MASTER	LAKE ERIE CHEM CO	10.60	752.3	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	1107.8	-1.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	159.9	12.8
BASEBALL	PENGUIN INDUSTRIES	2.00	-1.0	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	2041.5	-1.0
206 SPEDEHEAT	FEDERAL LABS	21.00	285.4	-1.0
219 SPEDEHEAT	FEDERAL LABS	21.00	285.4	-1.0
230 FLITE RITE	FEDERAL LABS	21.00	285.4	-1.0
232 FLITE RITE	FEDERAL LABS	5.50	-1.0	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	-1.0	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	-1.0	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	221.0	24.6
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	-1.0	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	-1.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	887.3	-1.0
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 26D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 6
AGENT - CN

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-110	AAI CORPORATION	14.00	533.5	-1.0
MPG-100	AAI CORPORATION	9.50	1214.9	-1.0
SKITTER 6001	BRUNSWICK CORP	8.00	-1.0	-1.0
109 POCKET	FEDERAL LABS	10.00	1044.4	-1.0
112 SPEDEHEAT	FEDERAL LABS	62.00	85.6	5.8
119 HAN-BALL	FEDERAL LABS	17.50	382.3	-1.0
120 DISINTEGRATING	FEDERAL LABS	15.30	464.5	-1.0
121 BLAST DISPERS.	FEDERAL LABS	15.30	464.5	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	82.8	5.5
MODEL 34	LAKE ERIE CHEM CO	6.00	-1.0	-1.0
MCB MASTER	LAKE ERIE CHEM CO	10.60	902.8	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	8.75	1712.4	-1.0
CN/SMOKE	PENGUIN INDUSTRIES	34.50	163.9	15.5
BASEBALL	PENGUIN INDUSTRIES	2.00	-1.0	-1.0
PROJECTILES				
203 S RANGE CART	FEDERAL LABS	7.30	-1.0	-1.0
206 SPEDEHEAT	FEDERAL LABS	21.00	299.2	-1.0
219 SPEDEHEAT	FEDERAL LABS	21.00	299.2	-1.0
230 FLITE RITE	FEDERAL LABS	21.00	299.2	-1.0
232 FLITE RITE	FEDERAL LABS	5.50	-1.0	-1.0
233 BLAST DISPERS.	FEDERAL LABS	5.50	-1.0	-1.0
234 BLAST DISPERS.	FEDERAL LABS	5.50	-1.0	-1.0
265 SKAT SHELL	FEDERAL LABS	26.00	228.9	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.70	-1.0	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	-1.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	9.70	1138.6	-1.0
LONG RANGE CART	PENGUIN INDUSTRIES	0.30	-1.0	-1.0

TABLE 27D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 1
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	2.3	7.0
SKITTER 5001	BRUNSWICK CORP	8.00	3.3	10.3
109 POCKET	FEDERAL LABS	10.00	2.6	8.1
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	1.7	5.1
515 TRIPLE CHASER	FEDERAL LABS	40.00	0.7	1.9
518 RIOT CONTROL	FEDERAL LABS	46.00	0.6	1.7
519 HAN-BALL	FEDERAL LABS	22.50	1.2	3.5
520 DISINTEGRATING	FEDERAL LABS	15.30	1.7	5.1
555 VISIBLE DUST	FEDERAL LABS	52.00	0.5	1.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.4	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	3.7	11.9
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	6.1	20.8
MOB MASTER	LAKE ERIE CHEM CO	8.50	3.1	9.6
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	4.4	14.1
RUBBER BALL	NORTHROP CAROLINA	30.00	0.9	2.6
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	13.1	59.5
MK-1 CASELESS	SMITH AND WESSON	5.00	5.2	17.4
M25A1 BASEBALL	U.S. GOV'T	5.20	5.0	16.6
M7A3	U.S. GOV'T	64.00	0.4	1.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	88.5	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	9.4	35.8
501 MUZZLE BLAST	FEDERAL LABS	7.30	3.6	11.3
505 MARK 70	FEDERAL LABS	5.50	4.8	15.6
507 MARK 200	FEDERAL LABS	5.50	4.8	15.6
509 ARROW FLITE	FEDERAL LABS	5.50	4.8	15.6
530 ARROW FLITE	FEDERAL LABS	17.50	1.5	4.5
560 VISIBLE MARK 22	FEDERAL LABS	21.00	1.2	3.7
565 SKAT SHELL	FEDERAL LABS	26.00	1.0	3.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	1.2	3.7
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	5.1	17.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	5.8	19.7
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	5.2	17.4
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	343.6	-1.0

TABLE 28D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 2
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	2.3	7.5
SKITTER 5001	BRUNSWICK CORP	8.00	3.3	1[illegible].3
109 POCKET	FEDERAL LABS	10.00	2.6	8.7
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	1.7	5.4
515 TRIPLE CHASER	FEDERAL LABS	40.00	0.7	1.9
518 RIOT CONTROL	FEDERAL LABS	46.00	0.6	1.7
519 HAN-BALL	FEDERAL LABS	22.50	1.2	3.6
520 DISINTEGRATING	FEDERAL LABS	15.30	1.7	5.4
555 VISIBLE DUST	FEDERAL LABS	52.00	0.5	1.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.4	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	3.7	13.4
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	6.1	26.4
MOB MASTER	LAKE ERIE CHEM CO	7.50	3.1	10.5
JUMPER REPEATER	LAKE ERIE CHEM CO	[illegible].00	4.4	16.3
RUBBER BALL	NORTHROP CAROLINA	3[illegible].00	0.9	2.6
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	13.2	-1.0
MK-1 CASELESS	SMITH AND WESSON	3.00	5.3	21.0
M25A1 BASEBALL	U.S. GOV'T	5.20	5.0	19.8
M7A3	U.S. GOV'T	64.00	0.4	1.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	89.6	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	9.4	68.6
501 MUZZLE BLAST	FEDERAL LABS	7.30	3.6	12.7
505 MARK 70	FEDERAL LABS	5.50	4.8	18.3
507 MARK 200	FEDERAL LABS	5.50	4.8	18.3
509 ARROW FLITE	FEDERAL LABS	5.50	4.8	18.3
530 ARROW FLITE	FEDERAL LABS	17.50	1.5	4.7
560 VISIBLE MARK 22	FEDERAL LABS	21.00	1.2	3.8
565 SKAT SHELL	FEDERAL LABS	26.00	1.0	3.1
570 VISIBLE MARK 77	FEDERAL LABS	21.00	1.2	3.8
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	5.1	20.4
TRU-FLITE	LAKE ERIE CHEM CO	4.50	5.8	24.6
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	5.3	21.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	361.7	-1.0

TABLE 29D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 3
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	2.3	8.0
SKITTER 5001	BRUNSWICK CORP	8.00	3.3	12.8
109 POCKET	FEDERAL LABS	10.00	2.6	9.5
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	1.7	5.7
515 TRIPLE CHASER	FEDERAL LABS	40.00	0.7	2.0
518 RIOT CONTROL	FEDERAL LABS	46.00	0.6	1.7
519 HAN-BALL	FEDERAL LABS	22.50	1.2	3.7
520 DISINTEGRATING	FEDERAL LABS	15.30	1.7	5.7
555 VISIBLE DUST	FEDERAL LABS	52.00	0.5	1.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.4	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	3.8	15.5
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	6.1	42.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	3.1	11.7
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	4.4	19.8
RUBBER BALL	NORTHROP CAROLINA	30.00	0.9	2.7
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	13.2	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	5.3	28.1
M25A1 BASEBALL	U.S. GOV'T	5.20	5.1	25.9
M7A3	U.S. GOV'T	64.00	0.4	1.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	90.7	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	9.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	3.6	14.5
505 MARK 70	FEDERAL LABS	5.50	4.8	23.2
507 MARK 200	FEDERAL LABS	5.50	4.8	23.2
509 ARROW FLITE	FEDERAL LABS	5.50	4.8	23.2
530 ARROW FLITE	FEDERAL LABS	17.50	1.5	4.9
560 VISIBLE MARK 22	FEDERAL LABS	21.00	1.2	4.0
565 SKAT SHELL	FEDERAL LABS	26.00	1.0	3
570 VISIBLE MARK 77	FEDERAL LABS	21.00	1.2	4.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	5.2	26.9
TRU-FLITE	LAKE ERIE CHEM CO	4.50	5.8	36.5
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	5.3	28.1
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	382.7	-1.0

TABLE 30D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 4
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	2.3	8.7
[illegible] 5001	BRUNSWICK CORP	8.00	3.3	14.9
[illegible] POCKET	FEDERAL LABS	10.00	2.6	10.5
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	1.7	6.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	0.7	2.0
518 RIOT CONTROL	FEDERAL LABS	46.00	0.6	1.7
519 HAN-BALL	FEDERAL LABS	22.50	1.2	3.8
520 DISINTEGRATING	FEDERAL LABS	15.30	1.7	6.0
555 VISIBLE DUST	FEDERAL LABS	52.00	0.5	1.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.4	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	3.8	19.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	6.1	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	3.1	13.4
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	4.4	27.3
RUBBER BALL	NORTHROP CAROLINA	30.00	0.9	2.8
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	[illegible]	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	5.3	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	5.1	51.4
M7A3	U.S. GOV'T	64.00	0.4	1.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	91.9	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	9.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	3.6	17.5
505 MARK 70	FEDERAL LABS	5.50	4.8	36.9
507 MARK 200	FEDERAL LABS	5.50	4.8	36.9
509 ARROW FLITE	FEDERAL LABS	5.50	4.8	36.9
530 ARROW FLITE	FEDERAL LABS	17.50	1.5	5.1
560 VISIBLE MARK 22	FEDERAL LABS	21.00	1.2	4.1
565 SKAT SHELL	FEDERAL LABS	26.00	1.0	3.2
570 VISIBLE MARK 77	FEDERAL LABS	21.00	1.2	4.1
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	5.2	64.5
TRU-FLITE	LAKE ERIE CHEM CO	4.50	5.8	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	5.3	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	407.4	-1.0

TABLE 31D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 5
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	2.3	9.6
SKITTER 5001	BRUNSWICK CORP	8.00	3.3	18.5
109 POCKET	FEDERAL LABS	10.00	2.6	11.9
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	1.7	6.4
515 TRIPLE CHASER	FEDERAL LABS	40.00	0.7	2.1
518 RIOT CONTROL	FEDERAL LABS	46.00	0.6	1.8
519 HAN-BALL	FEDERAL LABS	22.50	1.2	3.9
520 DISINTEGRATING	FEDERAL LABS	15.30	1.7	6.4
555 VISIBLE DUST	FEDERAL LABS	52.00	0.5	1.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.4	1.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	3.8	27.4
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	6.1	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	3.1	16.2
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	4.4	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	0.9	2.8
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	13.2	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	5.3	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	5.1	-1.0
M7A3	U.S. GOV'T	64.00	0.4	1.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	93.2	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	9.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	3.6	23.7
505 MARK 70	FEDERAL LABS	5.50	4.8	-1.0
507 MARK 200	FEDERAL LABS	5.50	4.8	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	4.8	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	1.5	5.3
560 VISIBLE MARK 22	FEDERAL LABS	21.00	1.2	4.3
565 SKAT SHELL	FEDERAL LABS	26.00	1.0	3.3
570 VISIBLE MARK 77	FEDERAL LABS	21.00	1.2	4.3
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	5.2	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	5.8	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	5.3	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	437.1	-1.0

TABLE 32D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 701.31 CU FT
AIR EXCHANGES/HR - 6
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	2.3	10.8
SKITTER 5001	BRUNSWICK CORP	8.00	3.3	28.7
109 POCKET	FEDERAL LABS	10.00	2.6	14.1
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	1.7	6.8
515 TRIPLE CHASER	FEDERAL LABS	40.00	0.7	2.1
518 RIOT CONTROL	FEDERAL LABS	46.00	0.6	1.8
519 HAN-BALL	FEDERAL LABS	22.50	1.2	4.1
520 DISINTEGRATING	FEDERAL LABS	15.30	1.7	6.8
555 VISIBLE DUST	FEDERAL LABS	52.00	0.5	1.6
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.4	1.3
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	3.8	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	6.1	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	3.1	21.9
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	4.4	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	0.9	2.9
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	13.3	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	5.3	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	5.1	-1.0
M7A3	U.S. GOV'T	64.00	0.4	1.3
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	94.4	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	9.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	3.6	-1.0
505 MARK 70	FEDERAL LABS	5.50	4.8	-1.0
507 MARK 200	FEDERAL LABS	5.50	4.8	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	4.8	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	1.5	5.6
560 VISIBLE MARK 22	FEDERAL LABS	21.00	1.2	4.5
565 SKAT SHELL	FEDERAL LABS	26.00	1.0	3.4
570 VISIBLE MARK 77	FEDERAL LABS	21.00	1.2	4.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	5.2	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	5.9	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	5.3	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	474.0	-1.0

TABLE 33D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 1
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	4.7	15.4
SKITTER 5001	BRUNSWICK CORP	8.00	6.7	23.4
109 POCKET	FEDERAL LABS	10.00	5.4	17.9
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	3.5	11.1
515 TRIPLE CHASER	FEDERAL LABS	40.00	1.3	4.0
518 RIOT CONTROL	FEDERAL LABS	46.00	1.2	3.5
519 HAN-BALL	FEDERAL LABS	22.50	2.4	7.3
520 DISINTEGRATING	FEDERAL LABS	15.30	3.5	11.1
555 VISIBLE DUST	FEDERAL LABS	52.00	1.0	3.1
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.8	2.5
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	7.7	27.6
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	12.5	55.1
MOB MASTER	LAKE ERIE CHEM CO	8.50	6.3	21.7
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	9.0	33.8
RUBBER BALL	NORTHROP CAROLINA	30.00	1.8	5.4
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	27.0	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	10.8	43.6
M25A1 BASEBALL	U.S. GOV'T	5.20	10.4	41.2
M7A3	U.S. GOV'T	64.00	0.8	2.5
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	184.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	19.3	153.3
501 MUZZLE BLAST	FEDERAL LABS	7.30	7.4	26.2
505 MARK 70	FEDERAL LABS	5.50	9.8	38.0
507 MARK 200	FEDERAL LABS	5.50	9.8	38.0
509 ARROW FLITE	FEDERAL LABS	5.50	9.8	38.0
530 ARROW FLITE	FEDERAL LABS	17.50	3.1	9.6
560 VISIBLE MARK 22	FEDERAL LABS	21.00	2.6	7.9
565 SKAT SHELL	FEDERAL LABS	26.00	2.1	6.3
570 VISIBLE MARK 77	FEDERAL LABS	21.00	2.6	7.9
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	10.6	42.4
TRU-FLITE	LAKE ERIE CHEM CO	4.50	12.0	51.2
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	10.8	43.6
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	744.8	-1.0

TABLE 34D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 2
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	4.7	18.1
SKITTER 5001	BRUNSWICK CORP	8.00	6.7	31.1
109 POCKET	FEDERAL LABS	10.00	5.4	21.8
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	3.5	12.4
515 TRIPLE CHASER	FEDERAL LABS	40.00	1.3	4.1
518 RIOT CONTROL	FEDERAL LABS	46.00	1.2	3.6
519 HAN-BALL	FEDERAL LABS	22.50	2.4	7.8
520 DISINTEGRATING	FEDERAL LABS	15.30	3.5	12.4
555 VISIBLE DUST	FEDERAL LABS	52.00	1.0	3.1
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.8	2.5
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	7.7	40.2
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	12.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	6.3	28.1
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	9.0	59.2
RUBBER BALL	NORTHROP CAROLINA	30.00	1.8	5.7
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	27.1	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	10.8	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	10.4	150.0
M7A3	U.S. GOV'T	64.00	0.8	2.5
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	189.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	19.3	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	7.4	36.9
505 MARK 70	FEDERAL LABS	5.50	9.8	84.0
507 MARK 200	FEDERAL LABS	5.50	9.8	84.0
509 ARROW FLITE	FEDERAL LABS	5.50	9.8	84.0
530 ARROW FLITE	FEDERAL LABS	17.50	3.1	10.5
560 VISIBLE MARK 22	FEDERAL LABS	21.00	2.6	8.5
565 SKAT SHELL	FEDERAL LABS	26.00	2.1	6.6
570 VISIBLE MARK 77	FEDERAL LABS	21.00	2.6	8.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	10.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	12.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	10.8	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	842.5	-1.0

TABLE 35D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 3
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	4.7	22.8
SKITTER 5001	BRUNSWICK CORP	8.00	6.7	69.1
109 POCKET	FEDERAL LABS	10.00	5.4	29.8
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	3.5	14.1
515 TRIPLE CHASER	FEDERAL LABS	40.00	1.3	4.3
518 RIOT CONTROL	FEDERAL LABS	46.00	1.2	3.7
519 HAN-BALL	FEDERAL LABS	22.50	2.4	8.4
520 DISINTEGRATING	FEDERAL LABS	15.30	3.5	14.1
555 VISIBLE DUST	FEDERAL LABS	52.00	1.0	3.2
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.8	2.6
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	7.7	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	12.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	6.3	48.5
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	9.0	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	1.8	6.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	27.2	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	10.8	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	10.4	-1.0
M7A3	U.S. GOV'T	64.00	0.8	2.6
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	194.3	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	19.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	7.4	-1.0
505 MARK 70	FEDERAL LABS	5.50	9.8	-1.0
507 MARK 200	FEDERAL LABS	5.50	9.8	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	9.8	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	3.1	11.7
560 VISIBLE MARK 22	FEDERAL LABS	21.00	2.6	9.2
565 SKAT SHELL	FEDERAL LABS	26.00	2.1	7.1
570 VISIBLE MARK 77	FEDERAL LABS	21.00	2.6	9.2
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	10.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	12.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	10.8	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	987.0	-1.0

TABLE 36D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 4
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	4.7	35.5
SKITTER 5001	BRUNSWICK CORP	8.00	6.8	-1.0
109 POCKET	FEDERAL LABS	10.00	5.4	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	3.5	16.9
515 TRIPLE CHASER	FEDERAL LABS	40.00	1.3	4.5
518 RIOT CONTROL	FEDERAL LABS	46.00	1.2	3.8
519 HAN-BALL	FEDERAL LABS	22.50	2.4	9.2
520 DISINTEGRATING	FEDERAL LABS	15.30	3.5	16.9
555 VISIBLE DUST	FEDERAL LABS	52.00	1.0	3.3
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.8	2.6
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	7.7	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	12.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	6.4	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	9.0	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	1.8	6.3
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	27.3	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	10.8	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	10.4	-1.0
M7A3	U.S. GOV'T	64.00	0.8	2.6
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	200.1	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	19.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	7.4	-1.0
505 MARK 70	FEDERAL LABS	5.50	9.8	-1.0
507 MARK 200	FEDERAL LABS	5.50	9.8	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	9.8	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	3.1	13.4
560 VISIBLE MARK 22	FEDERAL LABS	21.00	2.6	10.2
565 SKAT SHELL	FEDERAL LABS	26.00	2.1	7.6
570 VISIBLE MARK 77	FEDERAL LABS	21.00	2.6	10.2
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	10.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	12.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	10.8	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	1238.9	-1.0

TABLE 37D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 5
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	4.7	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	6.8	-1.0
109 POCKET	FEDERAL LABS	10.00	5.4	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	3.5	22.3
515 TRIPLE CHASER	FEDERAL LABS	40.00	1.3	4.7
518 RIOT CONTROL	FEDERAL LABS	46.00	1.2	4.0
519 HAN-BALL	FEDERAL LABS	22.50	2.4	10.2
520 DISINTEGRATING	FEDERAL LABS	15.30	3.5	22.3
555 VISIBLE DUST	FEDERAL LABS	52.00	1.0	3.4
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.8	2.7
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	7.7	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	12.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	6.4	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	9.0	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	1.8	6.8
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	27.4	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	10.8	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	10.4	-1.0
M7A3	U.S. GOV'T	64.00	0.8	2.7
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	206.4	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	19.5	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	7.4	-1.0
505 MARK 70	FEDERAL LABS	5.50	9.9	-1.0
507 MARK 200	FEDERAL LABS	5.50	9.9	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	9.9	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	3.1	16.1
560 VISIBLE MARK 22	FEDERAL LABS	21.00	2.6	11.5
565 SKAT SHELL	FEDERAL LABS	26.00	2.1	8.2
570 VISIBLE MARK 77	FEDERAL LABS	21.00	2.6	11.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	10.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	12.1	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	10.8	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	1962.0	-1.0

TABLE 38D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 1440.00 CU FT
AIR EXCHANGES/HR - 6
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	4.7	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	6.8	-1.0
109 POCKET	FEDERAL LABS	10.00	5.4	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	3.5	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	1.3	4.9
518 RIOT CONTROL	FEDERAL LABS	46.00	1.2	4.1
519 HAN-BALL	FEDERAL LABS	22.50	2.4	11.7
520 DISINTEGRATING	FEDERAL LABS	15.30	3.5	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	1.0	3.5
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	0.8	2.8
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	7.7	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	12.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	6.4	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	9.0	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	1.8	7.3
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	27.5	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	10.9	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	10.4	-1.0
M7A3	U.S. GOV'T	64.00	0.8	2.8
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	213.2	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	19.5	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	7.4	-1.0
505 MARK 70	FEDERAL LABS	5.50	9.9	-1.0
507 MARK 200	FEDERAL LABS	5.50	9.9	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	9.9	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	3.1	21.7
560 VISIBLE MARK 22	FEDERAL LABS	21.00	2.6	13.4
565 SKAT SHELL	FEDERAL LABS	26.00	2.1	9.1
570 VISIBLE MARK 77	FEDERAL LABS	21.00	2.6	13.4
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	10.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	12.1	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	10.9	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 39D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 1
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	13.1	59.5
SKITTER 5001	BRUNSWICK CORP	8.00	18.7	136.2
109 POCKET	FEDERAL LABS	10.00	15.0	75.8
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	9.8	38.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	3.7	11.9
518 RIOT CONTROL	FEDERAL LABS	46.00	3.3	10.2
519 HAN-BALL	FEDERAL LABS	22.50	6.7	23.0
520 DISINTEGRATING	FEDERAL LABS	15.30	9.8	38.0
555 VISIBLE DUST	FEDERAL LABS	52.00	2.9	8.9
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	2.3	7.1
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	21.4	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	34.9	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	17.6	111.5
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	25.0	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	5.0	16.4
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	75.5	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	30.0	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	28.9	-1.0
M7A3	U.S. GOV'T	64.00	2.3	7.1
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	536.4	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	53.8	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	20.5	243.4
505 MARK 70	FEDERAL LABS	5.50	27.3	-1.0
507 MARK 200	FEDERAL LABS	5.50	27.3	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	27.3	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	8.6	31.6
560 VISIBLE MARK 22	FEDERAL LABS	21.00	7.1	25.1
565 SKAT SHELL	FEDERAL LABS	26.00	5.8	19.4
570 VISIBLE MARK 77	FEDERAL LABS	21.00	7.1	25.1
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	29.4	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	33.4	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	30.0	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	2635.9	-1.0

TABLE 40D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 2
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	13.2	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	18.8	-1.0
109 POCKET	FEDERAL LABS	10.00	15.0	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	9.8	83.3
515 TRIPLE CHASER	FEDERAL LABS	40.00	3.7	13.3
518 RIOT CONTROL	FEDERAL LABS	46.00	3.3	11.2
519 HAN-BALL	FEDERAL LABS	22.50	6.7	30.5
520 DISINTEGRATING	FEDERAL LABS	15.30	9.8	83.3
555 VISIBLE DUST	FEDERAL LABS	52.00	2.9	9.7
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	2.3	7.6
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	21.5	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	35.1	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	17.7	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	25.1	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	5.0	19.5
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	76.4	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	30.2	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	29.0	-1.0
M7A3	U.S. GOV'T	64.00	2.3	7.6
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	583.5	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	54.2	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	20.6	-1.0
505 MARK 70	FEDERAL LABS	5.50	27.4	-1.0
507 MARK 200	FEDERAL LABS	5.50	27.4	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	27.4	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	8.6	51.4
560 VISIBLE MARK 22	FEDERAL LABS	21.00	7.1	34.5
565 SKAT SHELL	FEDERAL LABS	26.00	5.8	24.1
570 VISIBLE MARK 77	FEDERAL LABS	21.00	7.1	34.5
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	29.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	33.5	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	30.2	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 41D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 3
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	13.2	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	18.8	-1.0
109 POCKET	FEDERAL LABS	10.00	15.0	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	9.8	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	3.7	15.4
518 RIOT CONTROL	FEDERAL LABS	46.00	3.3	12.6
519 HAN-BALL	FEDERAL LABS	22.50	6.7	62.7
520 DISINTEGRATING	FEDERAL LABS	15.30	9.8	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	2.9	10.7
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	2.3	8.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	21.6	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	35.3	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	17.7	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	25.2	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	5.0	25.3
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	77.2	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	30.3	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	29.1	-1.0
M7A3	U.S. GOV'T	64.00	2.3	8.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	644.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	54.6	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	20.7	-1.0
505 MARK 70	FEDERAL LABS	5.50	27.5	-1.0
507 MARK 200	FEDERAL LABS	5.50	27.5	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	27.5	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	8.6	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	7.1	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	5.8	35.2
570 VISIBLE MARK 77	FEDERAL LABS	21.00	7.1	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	29.7	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	33.7	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	30.3	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 42D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 4
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	13.2	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	18.9	-1.0
109 POCKET	FEDERAL LABS	10.00	15.1	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	9.8	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	3.7	19.0
518 RIOT CONTROL	FEDERAL LABS	46.00	3.3	14.7
519 HAN-BALL	FEDERAL LABS	22.50	6.7	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	9.8	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	2.9	12.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	2.3	8.9
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	21.6	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	35.5	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	17.8	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	25.3	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	5.0	47.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	78.0	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	30.4	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	29.2	-1.0
M7A3	U.S. GOV'T	64.00	2.3	8.9
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	726.2	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	55.0	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	20.7	-1.0
505 MARK 70	FEDERAL LABS	5.50	27.6	-1.0
507 MARK 200	FEDERAL LABS	5.50	27.6	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	27.6	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	8.6	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	7.1	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	5.8	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	7.1	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	29.8	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	33.9	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	30.4	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 43D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 5
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	13.2	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	18.9	-1.0
109 POCKET	FEDERAL LABS	10.00	15.1	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	9.8	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	3.7	27.2
518 RIOT CONTROL	FEDERAL LABS	46.00	3.3	18.2
519 HAN-BALL	FEDERAL LABS	22.50	6.7	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	9.8	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	2.9	14.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	2.3	9.9
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	21.7	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	35.6	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	17.8	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	25.4	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	5.0	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	78.9	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	30.5	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	29.3	-1.0
M7A3	U.S. GOV'T	64.00	2.3	9.9
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	848.4	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	55.5	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	20.8	-1.0
505 MARK 70	FEDERAL LABS	5.50	27.7	-1.0
507 MARK 200	FEDERAL LABS	5.50	27.7	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	27.7	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	8.6	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	7.2	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	5.8	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	7.2	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	29.9	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	34.0	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	30.5	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 44D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE - 4000.00 CU FT
AIR EXCHANGES/HR - 6
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	13.3	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	19.0	-1.0
109 POCKET	FEDERAL LABS	10.00	15.1	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	9.9	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	3.7	-1.0
518 RIOT CONTROL	FEDERAL LABS	46.00	3.3	27.4
519 HAN-BALL	FEDERAL LABS	22.50	6.7	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	9.9	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	2.9	17.6
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	2.3	11.2
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	21.7	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	35.8	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	17.9	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	25.5	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	5.0	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	79.8	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	30.7	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	29.5	-1.0
M7A3	U.S. GOV'T	64.00	2.3	11.2
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	1065.4	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	55.9	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	20.8	-1.0
505 MARK 70	FEDERAL LABS	5.50	27.8	-1.0
507 MARK 200	FEDERAL LABS	5.50	27.8	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	27.8	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	8.6	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	7.2	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	5.8	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	7.2	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	30.1	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	34.2	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	30.7	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 45D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 1
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	52.8	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	75.5	-1.0
109 POCKET	FEDERAL LABS	10.00	60.3	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	39.3	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	15.0	75.8
518 RIOT CONTROL	FEDERAL LABS	46.00	13.0	58.7
519 HAN-BALL	FEDERAL LABS	22.50	26.7	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	39.3	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	11.5	48.2
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	9.4	35.7
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	86.5	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	141.8	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	71.1	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	101.1	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	20.0	188.1
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	312.2	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	121.6	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	116.9	-1.0
M7A3	U.S. GOV'T	64.00	9.4	35.7
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	2904.8	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	220.2	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	82.9	-1.0
505 MARK 70	FEDERAL LABS	5.50	110.4	-1.0
507 MARK 200	FEDERAL LABS	5.50	110.4	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	110.4	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	34.3	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	28.6	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	23.1	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	28.6	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	119.2	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	135.4	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	121.6	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 46D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 2
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	53.2	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	76.4	-1.0
109 POCKET	FEDERAL LABS	10.00	60.8	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	39.5	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	15.0	-1.0
518 RIOT CONTROL	FEDERAL LABS	46.00	13.0	-1.0
519 HAN-BALL	FEDERAL LABS	22.50	26.8	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	39.5	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	11.5	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	9.4	68.1
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	87.5	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	144.7	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	71.8	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	102.5	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	20.0	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	327.0	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	123.8	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	118.8	-1.0
M7A3	U.S. GOV'T	64.00	9.4	68.1
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	-1.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	227.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	83.8	-1.0
505 MARK 70	FEDERAL LABS	5.50	112.2	-1.0
507 MARK 200	FEDERAL LABS	5.50	112.2	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	112.2	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	34.5	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	28.7	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	23.2	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	28.7	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	121.3	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	138.1	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	123.8	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 47D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 3
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT, G	TIME TO ACHIEVE ICT84, SEC	TIME TO ACHIEVE LCT1, MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	53.6	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	77.2	-1.0
109 POCKET	FEDERAL LABS	10.00	61.3	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	39.7	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	15.0	-1.0
518 RIOT CONTROL	FEDERAL LABS	46.00	13.1	-1.0
519 HAN-BALL	FEDERAL LABS	22.50	26.9	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	39.7	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	11.6	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	9.4	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	88.6	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	147.8	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	72.5	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	104.1	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	20.1	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	343.9	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	126.0	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	120.9	-1.0
M7A3	U.S. GOV'T	64.00	9.4	-1.0
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	-1.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	235.2	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	84.9	-1.0
505 MARK 70	FEDERAL LABS	5.50	114.0	-1.0
507 MARK 200	FEDERAL LABS	5.50	114.0	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	114.0	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	34.7	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	28.8	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	23.2	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	28.8	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	123.4	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	140.9	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	126.0	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 48D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 4
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	54.1	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	78.0	-1.0
109 POCKET	FEDERAL LABS	10.00	61.9	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	40.0	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	15.1	-1.0
518 RIOT CONTROL	FEDERAL LABS	46.00	13.1	-1.0
519 HAN-BALL	FEDERAL LABS	22.50	27.0	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	40.0	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	11.6	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	9.4	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	89.8	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	151.1	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	73.3	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	105.6	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	20.2	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	363.5	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	128.3	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	123.1	-1.0
M7A3	U.S. GOV'T	64.00	9.4	-1.0
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	-1.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	243.8	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	85.9	-1.0
505 MARK 70	FEDERAL LABS	5.50	115.9	-1.0
507 MARK 200	FEDERAL LABS	5.50	115.9	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	115.9	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	34.8	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	28.9	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	23.3	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	28.9	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	125.6	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	143.8	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	128.3	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 49D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 5
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	54.5	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	78.9	-1.0
109 POCKET	FEDERAL LABS	10.00	62.4	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	40.2	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	15.1	-1.0
518 RIOT CONTROL	FEDERAL LABS	46.00	13.1	-1.0
519 HAN-BALL	FEDERAL LABS	22.50	27.1	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	40.2	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	11.6	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	9.4	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	90.9	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	154.5	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	74.0	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	107.3	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	20.2	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	386.4	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	130.8	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	125.3	-1.0
M7A3	U.S. GOV'T	64.00	9.4	-1.0
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	-1.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	253.4	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	87.0	-1.0
505 MARK 70	FEDERAL LABS	5.50	117.9	-1.0
507 MARK 200	FEDERAL LABS	5.50	117.9	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	117.9	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	35.0	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	29.1	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	23.4	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	29.1	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	128.0	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	146.9	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	130.8	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

TABLE 50D

TIMES TO ACHIEVE ICT84 AND LCT1 DOSAGES
ROOM SIZE -16000.00 CU FT
AIR EXCHANGES/HR - 6
AGENT - CS

DEVICE	MANUFACTURER	ASSUMED AIRBORNE AGENT,G	TIME TO ACHIEVE ICT84,SEC	TIME TO ACHIEVE LCT1,MIN
GRENADES				
MPG-120	AAI CORPORATION	11.40	54.9	-1.0
SKITTER 5001	BRUNSWICK CORP	8.00	79.8	-1.0
109 POCKET	FEDERAL LABS	10.00	63.0	-1.0
514 FLAMEPROOF DUST	FEDERAL LABS	15.30	40.4	-1.0
515 TRIPLE CHASER	FEDERAL LABS	40.00	15.1	-1.0
518 RIOT CONTROL	FEDERAL LABS	46.00	13.1	-1.0
519 HAN-BALL	FEDERAL LABS	22.50	27.2	-1.0
520 DISINTEGRATING	FEDERAL LABS	15.30	40.4	-1.0
555 VISIBLE DUST	FEDERAL LABS	52.00	11.6	-1.0
CONT. DISCHARGE	LAKE ERIE CHEM CO	64.00	9.4	-1.0
MIGHTY MIDGET	LAKE ERIE CHEM CO	7.00	92.2	-1.0
MODEL 34 INST DISCH	LAKE ERIE CHEM CO	4.30	158.2	-1.0
MOB MASTER	LAKE ERIE CHEM CO	8.50	74.8	-1.0
JUMPER REPEATER	LAKE ERIE CHEM CO	6.00	109.0	-1.0
RUBBER BALL	NORTHROP CAROLINA	30.00	20.3	-1.0
G-8 BASEBALL	PENGUIN INDUSTRIES	2.00	413.9	-1.0
MK-1 CASELESS	SMITH AND WESSON	5.00	133.4	-1.0
M25A1 BASEBALL	U.S. GOV'T	5.20	127.7	-1.0
M7A3	U.S. GOV'T	64.00	9.4	-1.0
PROJECTILES				
SGA-100 FERRET	AAI CORPORATION	0.30	-1.0	-1.0
SGA-300 FERRET	AAI CORPORATION	2.80	264.0	-1.0
501 MUZZLE BLAST	FEDERAL LABS	7.30	88.1	-1.0
505 MARK 70	FEDERAL LABS	5.50	120.0	-1.0
507 MARK 200	FEDERAL LABS	5.50	120.0	-1.0
509 ARROW FLITE	FEDERAL LABS	5.50	120.0	-1.0
530 ARROW FLITE	FEDERAL LABS	17.50	35.2	-1.0
560 VISIBLE MARK 22	FEDERAL LABS	21.00	29.2	-1.0
565 SKAT SHELL	FEDERAL LABS	26.00	23.5	-1.0
570 VISIBLE MARK 77	FEDERAL LABS	21.00	29.2	-1.0
LONG R INST DISCH	LAKE ERIE CHEM CO	5.10	130.5	-1.0
TRU-FLITE	LAKE ERIE CHEM CO	4.50	150.2	-1.0
SHORT RANGE SHELL	LAKE ERIE CHEM CO	5.00	133.4	-1.0
BARRICADE PENET	PENGUIN INDUSTRIES	0.08	-1.0	-1.0

END