RR NO.
11

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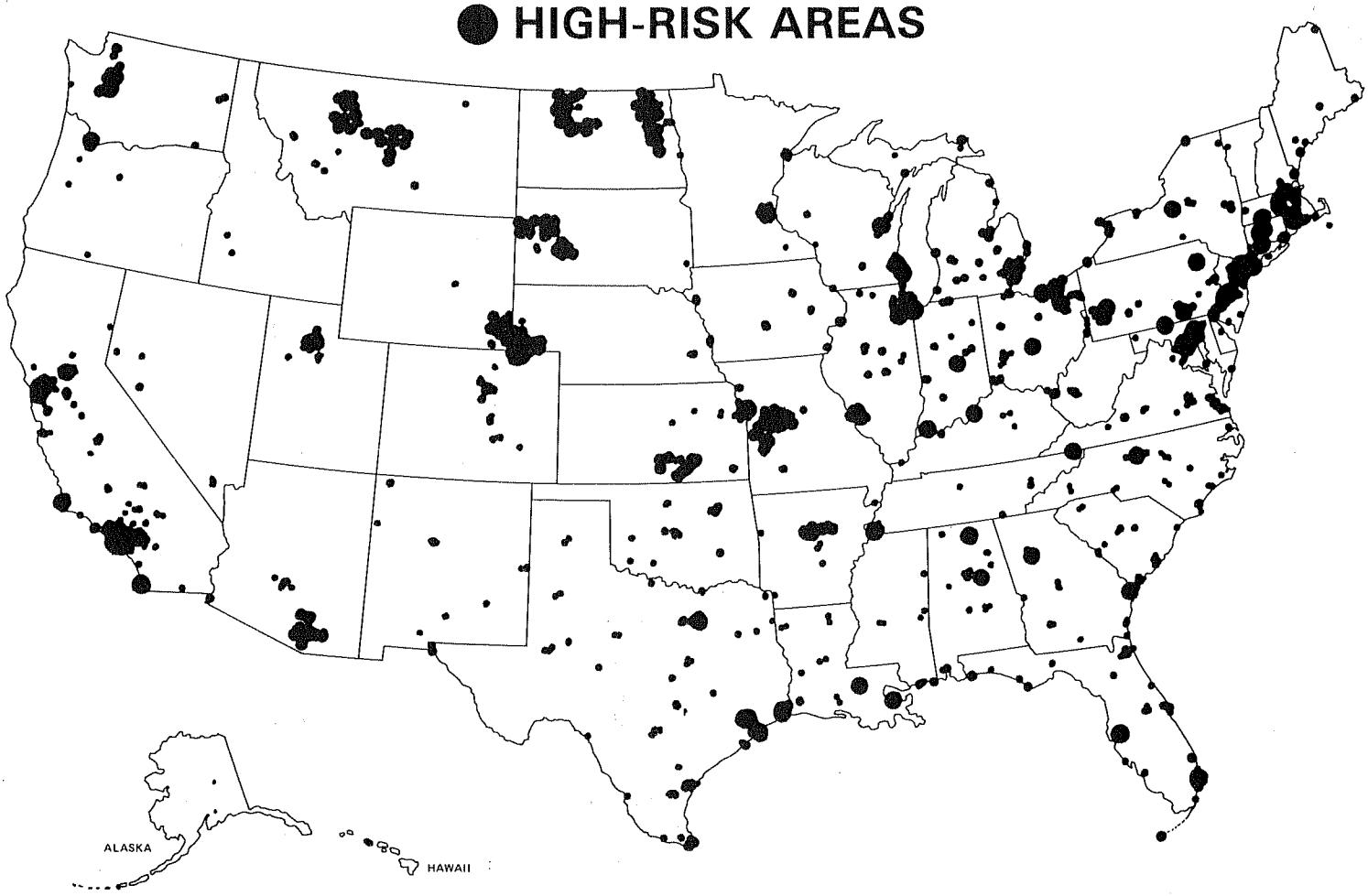
U.S. CRISIS RELOCATION PLANNING

Federal Emergency Management Agency

#73632261 STAR 12058 KR#11

HIGH-RISK AREAS



Nuclear attack on the United States is not considered likely, but neither is it impossible. As the Chairman of the Joint Chiefs of Staff said in his January 1980 annual report to the Congress,

> "We face a period of high risk and great uncertainty in the strategic balance throughout most of the coming decade.... (A)ll the signs point to even greater risks as the days pass.... (In view of the potentials for instability in the Mideast) a crisis could result at any time...."

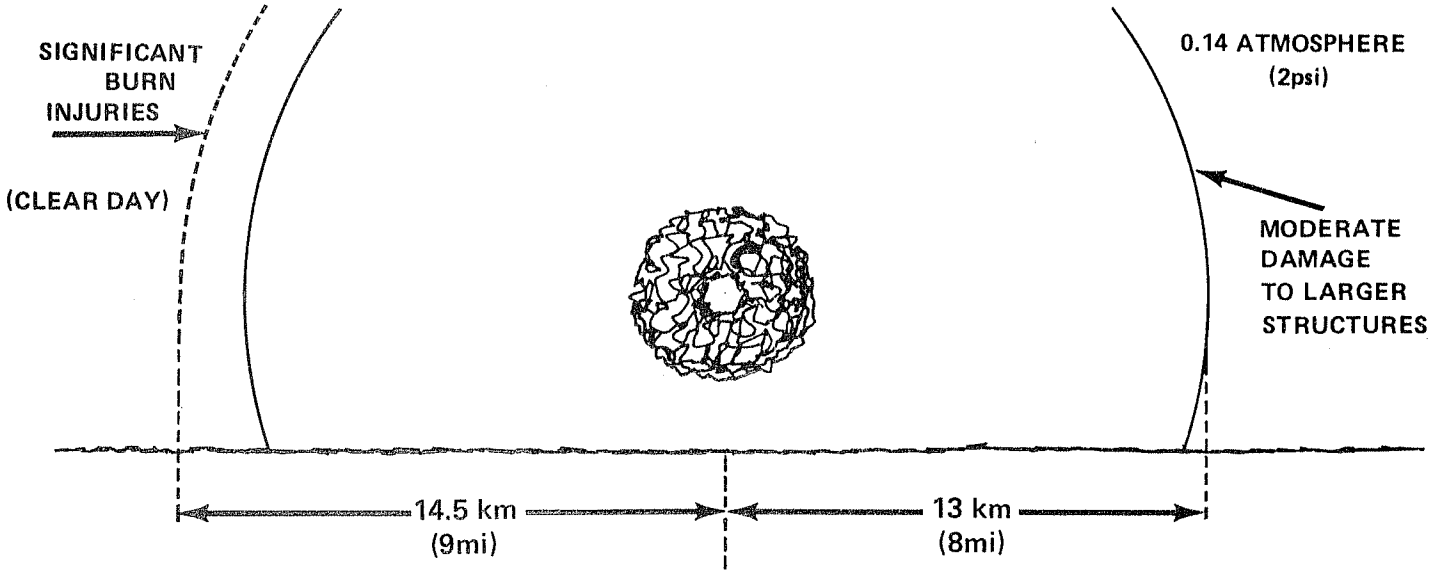
The map above shows what a heavy attack on the United States could look like. There could, of course, be lighter attacks--but prudence dictates that planning be based on a potentially heavy attack.

The "risk areas" shown include (1) 51 so-called "counterforce" areas containing U.S. strategic offensive forces--nine ICBM complexes, about 40 SAC bases, and 3 ballistic missile submarine ports; (2) some 250 metropolitan areas of more than 50,000 population; and (3) about 100 additional areas with other important military and economic installations. These risk areas cover only 2 to 3 percent of the land area of the United States, but in them are about two-thirds of our population and a somewhat higher percentage of our industry.

The population at risk can be protected (1) by providing high-performance blast shelters in cities; or (2) by relocating (evacuating) the people to low-risk "host" areas outside the risk areas, over a period of several days during an acute crisis.

Because of the great cost of blast shelters (some $70 billion), and because tens of millions can be saved by evacuation, current U.S. policy is to "achieve" a nationwide capability for crisis relocation. This policy was enunciated in Presidential Directive 41, September 1978--which also directed that U.S. civil defense enhance deterrence and stability, reduce the possibility of Soviet crisis coercion, and be adaptable to help deal with peacetime emergencies and disasters.

ONE MT. AIR BURST



Most weapons delivered to the U.S. would probably not exceed about 1 megaton.

For a 1 MT air burst:

-- Larger structures suffer moderate damage at about 13 km (8 miles).

-- Houses suffer severe damage at 13 km, but most people in home basements at that distance would be uninjured.

-- People in the open would suffer significant burn injuries (7.5 cal/cm^2) at about 14.5 km (9 miles). However, one would expect all evacuees to be in shelter at time of attack.

-- People in Soviet-style expedient shelters constructed outdoors should survive within about 2.5 km (1.5 miles) of a 1 MT air burst.

A few places could be attacked with larger weapons. In that case, the danger radii could be up to 3 times greater.

Current U.S. planning calls for evacuating areas considered likely to suffer 2 pounds per square inch (about 0.14 atmosphere) of blast overpressure. The risk areas to be evacuated cover about 2 to 3 percent of the U.S. land mass--a relatively small area compared to the size of the receiving host areas.

The average evacuation distance would be perhaps 30 to 80 miles for all but the largest cities (about 190 miles for New York City and 200 miles for Los Angeles, for example).

FALLOUT DISTRIBUTION

The distribution of fallout particles after a nuclear attack would depend on wind currents, weather conditions and other factors. There is no way of predicting in advance what areas of the country would be affected by fallout, or how soon the particles would fall back to earth at a particular location.

Some communities might get a heavy accumulation of fallout, while others--even in the same general area--might get little or none. No area in the U.S. could be sure of not getting fallout, and it is probable that some fallout particles would be deposited on most of the country.

Areas close to a nuclear explosion might receive fallout within 15-30 minutes. It might take 5-10 hours or more for the particles to drift down on a community 100 or 200 miles away.

In a large-scale attack with most weapons surface burst, people would need to stay in fallout shelters for varying lengths of time. With full crisis relocation, in-shelter staytimes could be approximately:

	% of Population
No time in shelter	20%
About 2 days	34%
Two days to 2 weeks	46%

The degree to which there would be surface bursts is uncertain. Thus, the time required to be spent in shelters could be significantly less.

SURVIVORS IN LARGE—SCALE ATTACKS

RELOCATION		1960		1985	
SOV	US	SOV	US	SOV	US
NO	NO	60%	70%	55	40%
YES	NO	—	—	90	40
YES	YES	—	—	90	80

In 1960, U.S. strategic superiority gave the U.S. a higher survival rate even in retaliation, as shown above.

In order to overcome this U.S. advantage, the USSR has been building up its strategic capabilities and at the same time developing a crisis relocation capability. As a result, now and in 1985 a 40% to 90% survival asymmetry could exist between the U.S. and the USSR if deterrence fails.

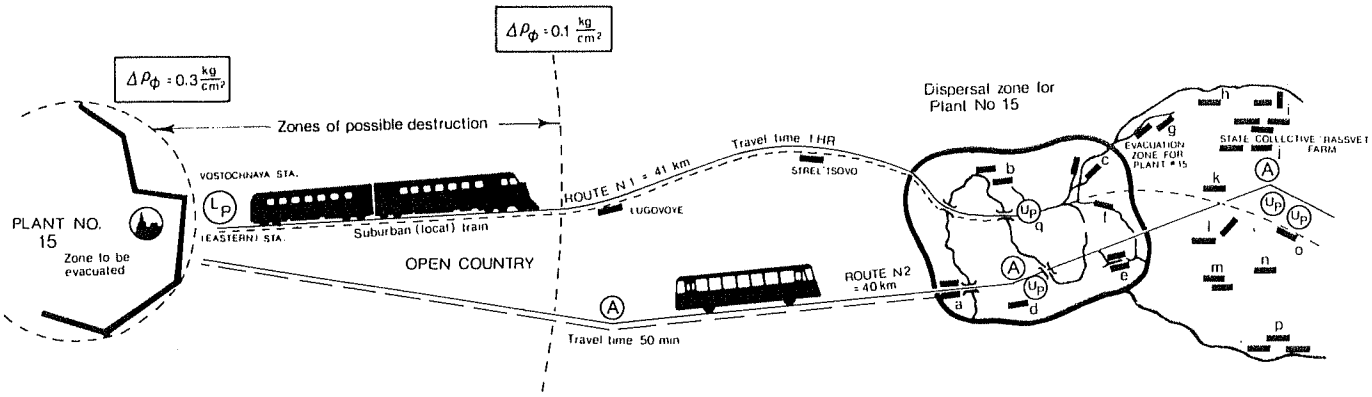
This could conceivably increase Soviet attempts at coercion during a crisis. As the Secretary of Defense said in 1975, the U.S. should have an option for crisis evacuation for two reasons:

> "(1) To be able to respond in kind if the Soviet Union attempts to intimidate us in a time of crisis by evacuating the population from its cities; and
>
> "(2) To reduce fatalities if an attack on our cities appears imminent."

It is for this reason that Presidential Directive (PD) 41, of September 1978, directed that the civil defense program "take advantage of (our) ... wide ownership of private automobiles (and) extensive highway systems ... to achieve" a capability for "... crisis relocation of the urban population," thereby enhancing the survivability of the American population and their leadership--in turn enhancing deterrence and stability and reducing the possibility of Soviet coercion during time of crisis.

Completion of U.S. crisis relocation plans (CRPs) should largely redress this asymmetry, except for increased Soviet survivability derived from some 15,000 blast shelters.

SOVIET DISPERSAL AND EVACUATION



a Krasnoye	e Lopukhovo	i Chernava	m Lukino	q Maslovka Station	Total relocated:
b Maslovka	f Dvoriki	j Pavlovo	n Markovo		311 workers & employees
c Karpovo	g Vyselki	k Sredniy	o Zhuravlevo		253 dependents
d Setun'	h Krapivino	l Goloveno	p Aleshkino		564

Ⓛp Loading point Ⓤp Unloading point

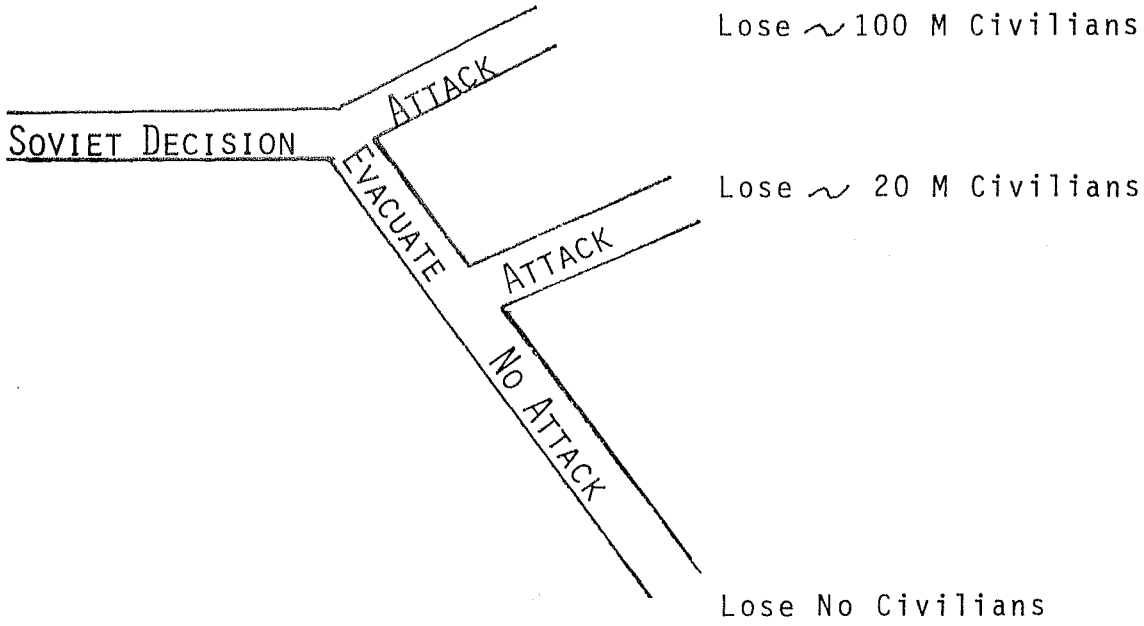
This diagram shows a plan for the dispersal of workers of a key Soviet plant (a National Economic Installation) and the evacuation of their dependents. The dashed lines indicate the overpressures anticipated (4.3 psi for the dashed circle and 1.4 psi for the outer zone of possible destruction). The roughly 25 mile initial movement of evacuees would take perhaps an hour.

The Soviets draw a distinction between evacuation and dispersal. "Evacuation" is the organized movement of employees from enterprises which have halted operations, along with their dependents and others not considered essential to continued operation of key enterprises. "Dispersal" is the organized movement from cities and facilities of workers who will commute back and forth between plants and host areas, to keep production going.

Typical Soviet evacuation plans for such facilities specify the number of workers and members of their families subject to dispersal and evacuation; evacuation assembly and reception points; measures to assure transportation; the departure area and marching routes; sequence of shifts; and transfer of workers to the dispersal region, to the working site, and back.

As suggested by the map, Soviet plans call for the use of trains and buses to the maximum extent possible.

SOVIET ATTACK TIMING AND PROSPECTS



The July 1978 unclassified report by the CIA on Soviet civil defense stated that:

-- The Soviets probably have sufficient blast-shelter space in hardened command posts for virtually all the leadership elements at all levels (about 110,000 people).

-- With a few hours of warning or less, the Soviets would suffer over 100 million casualties, but a large percentage of the leadership elements would probably survive.

-- With 2 or 3 days of preparation, the Soviets would suffer less than 50 million casualties.

-- With a week (or more) they would suffer casualties in the low tens of millions.

-- Therefore, the critical decision to be made by the Soviet leaders in terms of sparing the population would be whether or not to evacuate cities. Only by evacuating the bulk of the urban population could they hope to achieve a marked reduction in the number of urban casualties.

Faced with these prospects, a reasonable Soviet decision-maker will in all likelihood evacuate his cities before striking U.S. cities. If he does this, our intelligence will see it and we will have time to use our greater number of cars and trucks to get out of our cities by the time they do.

Therefore, we are planning on the likelihood that we will receive the strategic warning needed to evacuate. Considering the large asymmetry in losses we would suffer if they evacuated and we did not, it is only prudent to assume strategic warning and proceed with crisis relocation planning.

MAJOR FACTORS CONSIDERED IN CD MODEL

CRISIS RELOCATION

- WILLINGNESS TO RELOCATE
- KNOWLEDGE OF PLANS
- FRACTION WITHOUT OWN AUTO
- AVAILABILITY OF FUEL AND TRANSPORT
- SPONTANEOUS EVACUATION
- TRAFFIC CONTROL; DISABLEMENTS
- ADVERSE WEATHER
- TIME TO CLEAR LARGE CITIES
- HOST PREPARATIONS
- LEADERSHIP AND DIRECTION

SHELTERING & WARNING

- SHELTER AVAILABILITY
- CRISIS SHELTER PRODUCTION
- SHELTER ASSIGNMENT POLICIES
- SPEED AND EXTENT OF WARNING
- WILLINGNESS TO MOVE TO SHELTER
- NUMBERS CAUGHT IN OPEN ENROUTE
- IN-SHELTER PROTECTIVE POSTURE

ATTACK EFFECTS

- ATTACK DETECTION
- SIZE, LOCATION, AND TIMING OF DETONATION
- CASUALTY FUNCTIONS
- ENTRAPMENT IN DEBRIS
- FIRE IGNITION AND SPREAD
- FALLOUT DISTRIBUTION AND DOSES

ATTACK OPERATIONS

- RESCUE CAPABILITIES
- FIRE PREVENTION AND SUPPRESSION
- SHELTER LEADERSHIP
- FALLOUT PROTECTIVE POSTURE
- D & C, RADIOLOGICAL ASSESSMENT
- REMEDIAL MOVEMENT; DECONTAMINATION
- ORGANIZATION AND COMMUNICATIONS

SHELTER ENDURANCE

- PHYSIOLOGICAL LIMITATIONS
- CLIMATIC VARIATIONS
- AVAILABILITY OF WATER AND VENTILATION

UNCERTAINTIES IN ALL THE ABOVE

FEMA has developed a casualty assessment system for use in civil defense program design and evaluation. It models the survival process in two mile by two mile cells (some 110,000 populated cells in all), to permit evaluation of individual program elements, such as crisis relocation planning.

Listed above are important factors considered explicitly in the new casualty assessment system. Some 30 types of inputs are made in the Population Defense Model, such as the population relocated during the crisis, fraction assigned to shelter, fraction in the open when detonations occur, fraction trapped in debris, and fraction rescued.

Technical factors have been estimated by experts and other operational and behavioral factors by FEMA panels. Some 16,000 estimates of this kind have been made, enabling the model to generate best-estimate results, with ranges of uncertainty.

LIVES SAVED BY CIVIL DEFENSE ELEMENTS

	CURRENT CD (VS NO CD)	FULL CD (VS CURRENT)
NUCLEAR CIVIL PROTECTION PLANNING AND SHELTER SURVEY	16.5 M	30.8 M
CRISIS SHELTER PRODUCTION	0	17.3 M
DIRECTION AND CONTROL (EOC, COMMUNICATION, RADEF)	2.7 M	10.1 M
SHELTER MANAGEMENT	0.7 M	8.7 M
SHELTER MARKING AND STOCKING	0	6.9 M
EXERCISES FOR KEY OFFICIALS	0.4 M	2.3 M
CITIZEN TRAINING AND EMERGENCY PUBLIC INFORMATION (EPI)	7.3 M	2.3 M
SHELTER RADIOLOGICAL DEFENSE	0.2 M*	1.6 M*
VENTILATION KITS	0	.9 M
PROTECTED BROADCAST STATIONS	0	.2 M
TOTAL	27.8 M	81.1 M

*INITIAL ROUGH ESTIMATES

NETC Library

A moderate-cost civil defense system can prevent scores of millions of casualties by (1) relocating people from America's risk areas during a crisis; and (2) minimizing radiation exposure during the week or so following attack.

Effective civil defense, however, requires much more than crisis relocation plans alone. Shown above are the major elements of civil defense--both the current U.S. program and an effective civil defense system based on crisis relocation--together with the number of survivors each can add.

Some of these elements exist at a partial level today. For example, by September 1980, crisis relocation plans were complete for ten percent of the U.S. population and about 580 Emergency Operating Centers existed outside high-risk areas--as against about 2,750 needed.

Other elements exist at a very low level today, or not at all. For example, there are no detailed plans for shelter production during a crisis; there is no current program to train Shelter Managers; no shelter stocks have been procured since the early 1960's; and very few simulated-emergency exercises are conducted for key officials.

FEMA has designed a moderate-cost, balanced civil defense program which includes the elements shown above--plus support for Federal, State, and local civil preparedness staffs, as well as research and development. This program stresses crisis relocation which could add over 100 M survivors to the 70 M likely to survive anyway. This program, then, could enable survival of roughly 80 percent of the U.S. population in a heavy attack.

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